BEST PRACTICES 2012

Cal Poly Irrigation Conservation and Site Water Quality Program

A comprehensive set of measures at Cal Poly San Luis Obispo has successfully enhanced water quality and management throughout the campus community, landscape, farm areas, and managed lands. This has improved water savings as well as landscape restoration, riparian enhancement, and erosion control.

Award Category

Water Efficiency/
Site Water Quality

Green Features

New central irrigation control system

Replaced three sports fields with artificial turf

Native plant restoration

Reclaimed water use for spray silage crops, and dairy washdown

Restoration of brownfield and disturbed lands resulting in improved storm water

Annual Water and Cost Savings

14% reduction in potable irrigation water use since 2009

20% reduction in agricultural water use since 2009

$107,000/yr potable water savings

$4,400/yr non-potable/ recycled water savings

Cost

$4M turf replacement

$849,000 other projects

Time Period

Initiated 2007 (ongoing)

Cal Poly San Luis Obispo has put in place a suite of water-use efficiency and water quality projects including: state-of-the-art irrigation controls, an artificial turf system for the sports complex, landscape and plant restoration, enhanced well and reservoir management and agricultural irrigation improvements.

Drought tolarant planting along paths leading to Poly Canyon Village. Image: Dennis Elliot.

As of the spring of 2012, Cal Poly SLO had just begun monitoring its new central irrigation control system — a Rainmaster Evolution DX2 ET — for the campuses' largest turf areas. The system is expected to reduce annual water usage for this task in the range of 20 to 30 percent. The turf areas served by the new system cover close to 12 acres. The conversion is estimaged to save 6 acre feet of potable water and 14 acre feet of non-potable water annually, with annual cost savings of $14,000 and $300, respectively. A key benefit of the new system is automatic real-time responsiveness to soil and atmospheric conditions, which helps to reduce over-watering. In addition to the conservation and associated cost savings, a further benefit is reduced maintenance, as the system offers instant notification of any malfunctions.

Another major irrigation reduction project was realized in 2009 when three grass fields used for recreational and intramural sports were replaced with artificial turf systems. The replacement turf not only drastically cuts down on water use and maintenance requirements, but also increases the playability of the fields which do not become disturbed in rainy weather or require subsequent recovery time as natural turf would. The artificial turf reduces annual maintenance costs (labor and materials) by 69 percent.The system is comprised of a synthetic upper, a Brock brand underlayment, sand bedding, and a porous sub-base layer to facilitate drainage. The annual water savings of the three fields amounts to 25.2 acre feet of water. Sprinkler use is only required during rare high heat and low wind events for surface cooling.

The artificial turf fields eliminate water use and reduce maintenance, increase the playability in rainy weather, and eliminate subsequent recovery time after rain.

A further example of maximizing water efficiency in the campus landscape is the native plant restoration area at Poly Canyon Village. Poly Canyon Village is a LEED Gold, 2,700 bed student housing development completed in the fall of 2009. The development is situated at the mouth of Poly Canyon and the Brizziolara Creek drainage, making it an ecologically sensitive site. Rather than disposing of the 100,000 yards of soil excavated for the new construction, the project team preserved it onsite to create a four-acre native plant restoration area. The landscaping positively impacts the site by preventing potential establishment of non-native invasive species, and has the added benefit of being well adapted to the local climate. The plants are grouped in zones based on water requirements and are served efficiently by drip irrigation; wood mulch adds an added layer of

2012

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Additional Awards

2011 Best Practice Award for Best Overall Sustainable Design: Poly Canyon Village

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Project Team

Cal Poly:
Facility Services; Facilities Planning and Capital Projects; College of Agriculture, Food and Environmental Science; College of Architecture and Environmental Design; Associated Students, Incorporated University Housing

Other Partners:
City of San Luis Obispo Utilities Department; Regional Water Quality Control Board; State Water Resources Control Board; State Department of Fish and Game; Army Corps of Engineers

More Information

www.afd.calpoly.edu/ehs/docs/WQMP_Jan_2005.pdf

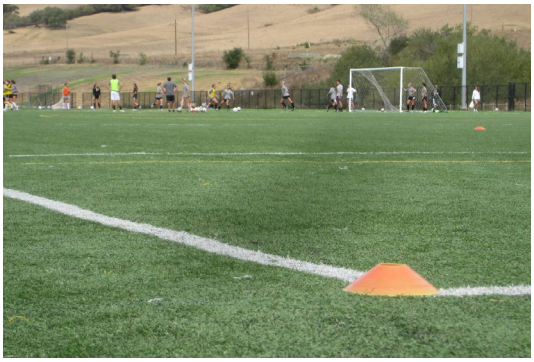
protection against evaporative water loss and helps retain moisture around the plant roots.

Besides cutting down on water use in the core campus landscape areas, efficiency has also been introduced into the agricultural water uses of the campus. An example of this is the dairy washdown and sprayfield irrigation project. The Cal Poly dairy (currently managing 240 cows) keeps the concrete floors of the animal's stalls clean of waste build-up by washing them down several times a day into two large holding ponds. The ponds filter solids that get transported to the campus compost facility, while the remaining liquid is recycled for use in the next wash-down. Some of this wastewater, along with waste water from the swine unit, is recycled further by being used to spray silage crops (used for animal feed) per a permit from the Regional Water Quality Control Board (RWQB). This management practice saves an estimated 34 acre feet of water per year.

A 2010 campus study led to numerous improvements to existing wells and to the design of a future irrigation pumping station that will improve water delivery and reduce electricity use.

A final series of campus water management upgrades highlights improvements to overall water quality, including pollution protection from non-point sources, and riparian restoration. The College of Agriculture, Food and Environmental sciences teamed with the campus Irrigation Training and Research Center in 2010 to evaluate campus agricultural irrigation practices. This research led to numerous improvements to existing wells including the installation of seven magnetic flow meters on the wells and at one pumping station and a new design for a future irrigation pumping station to improve water delivery while reducing electricity use.

Another project partially funded by the RWQB focused on the control of sediment discharge into Brizziolara Creek. The polluting sediment that had been washing down from various areas was mitigated by improved drainage, culverting, and erosion control. A riparian corridor enhancement area used fencing and the planting of native woody species to further stabilize and protect the creek. Student researchers will continue to monitor the impact of these water quality best management practices.



Cal Poly's artificial turf playing fields reduce water use and maintenance costs. Image: Dennis Elliot.

LESSONS LEARNED

Due to the comprehensive campus-wide nature of the water efficiency, water quality and water management projects under the Irrigation Water Conservation and Site Water Quality Program umbrella, Cal Poly sought to work with all stakeholders early and often. Keeping communication channels open with the local and state regulatory agencies, advisors and campus groups was the key to clearly identifying work scopes and setting goals. A number of the projects involved student participation and/or are used for teaching and demonstration, thereby underscoring Cal Poly's "learn by doing" philosophy. Campus administrators have found that they have been able to parlay savings from the program into new campus sustainability initiatives.

Best Practices case studies are coordinated by the Green Building Research Center, at the University of California, Berkeley.

The Best Practices Competition showcases successful projects on UC and CSU campuses to assist campuses in achieving energy efficiency and sustainability goals. Funding for *Best Practices* is provided by the UC/CSU/IOU Energy Efficiency Partnership.