

Underwood Family Sonoran Landscape Laboratory

Tucson, Arizona, U.S.A.

The Sonoran Landscape Laboratory at the University of Arizona is a high-performance landscape garden that serves as a model for sustainable design in the arid Southwest. The project successfully merged a new classroom building at the College of Architecture and Landscape Architecture (CALA) with the surrounding landscape by transforming an adjacent parking lot into an outdoor classroom and scenic gathering place for students and professors. Completed in the fall of 2007, The Sonoran Landscape Laboratory was designed as a low-cost, research-oriented, educational public space focusing on water-conscious design solutions while creating urban wildlife habitat and biomass.

A major goal of the project is to showcase sustainable water-management practices by providing a solution for building greywater and stormwater runoff. To accomplish this, an extensive water-harvesting system collects roof runoff, HVAC condensation, and building waste from sinks and drinking fountains in an 11,600-gallon storage tank. The tank then feeds a high-efficiency drip irrigation system that provides the necessary water for the landscape's native plant life. The system harvests approximately 230,000 gallons of water annually, accounting for 83 percent of the water needed.

To accommodate storage tank overflow and surface-water runoff during rain events, water is designed to flow into a desert pond and then a bioswale arroyo. The arroyo soaks up water and lets it flow more slowly through a bioswale planted with native Arizona vegetation before reaching the campus storm sewer. This system helps mitigate the problems associated with rapid urban water runoff, providing critical detention and filtration, while simultaneously nourishing the landscape. The desert arroyo restoration uses recycled materials salvaged from a demolished building and incorporates brick and concrete rubble to construct the swale's "microbasins."

Ten Eyck's design also integrates an existing well that required daily flushing for proper operation. This maintenance activity resulted in approximately 200 gallons per day being expelled into a city storm-drain system. To sustainably manage the water on site, the water now diverts into the desert pond to help maintain its water level and add minerals to the water to produce a proper habitat for desert fish species.

The project increases the biomass of the site by 50 percent even with the addition of a new building in an existing urban setting. As part of the teaching garden "laboratory," five distinct Arizona biomes, which are ecological communities, are represented within the project limits. The resulting urban wildlife habitat has attracted many species of birds, ground mammals, and reptiles to the garden. The pond is home for endangered fish and is listed by the U.S. Fish and Wildlife Service as a "Safe Harbor" urban site.

The cooler microclimate created by the garden has increased opportunities for outdoor learning in a harsh desert environment. The landscape serves as a hands-on laboratory for students to explore the natural processes and measure the tangible benefits of sustainable design. An accessible, sunken outdoor classroom of permeable, stabilized granite provides a place for lectures, study, and building projects, while detaining water during desert storm events. The laboratory helps students generate innovative strategies for future sustainable designs.

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Project Resources

TELA PROJECT TEAM

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