

Reuse It Or Lose It

Professor Kevin Lansey, head of the department of civil engineering and engineering mechanics, and four UA colleagues have been awarded \$2 million by the NSF to research water reuse and supply systems.



Kevin Lansey

The research project will ultimately produce a computer model for water managers who are grappling with the problem of using less energy while meeting increased demand for water.

Arizona's surface-water supplies, especially near urban areas, are all spoken for, and many communities

rely on water pumped up from aquifers. Such a resource is unsustainable, and some of Lansey's research revolves around the question of how willing we are to reuse wastewater and to what extent.

"In water-scarce areas, people will eventually have to use reused water as part of their water supply," says Lansey.



"And now the question is how much further people will use it." A dual water supply

circulates two types of water throughout a community: fresh and treated. Fresh water is what we drink and wash in; treated, or recycled, water is nonpotable and can be used in toilets and fire hydrants, and for irrigation.

The computer-modeling tool will play a role in designing city recycling systems. "Instead of having one centralized plant, choose a decentralized design," says Lansey. "You could have multiple satellite wastewater treatment plants based on a dual distribution system that provides potable water for consumption and nonpotable water for reuse."

Another hard choice will eventually have to be made regarding the reuse of water for drinking. People have made it very clear that the notion of drinking former sewage water can be hard to swallow. The City of Los Angeles tried it in the 1990s, but a newspaper headline—"toilet to tap"—scared so many residents that the plan was scrapped virtually overnight.

The technology does exist to fully purify wastewater and make it safe and potable, but our resistance is understandable. In the desert Southwest, Lansey can see the day coming when demand for clean drinking water makes it a costly commodity. "We either accept expensive water or we leave the desert," he says.



College of Engineering/Ben Sternberg

Going Underground—Geoscience and geological engineering students probe the ground with a magnetometer (left) and an electromagnetic instrument (front). This is the type of class and field activity in which the Saguaro students will be involved.

Geoscientists Reach Out

The NSF has awarded \$155,000 to a group of engineers and geoscientists to launch an outreach program designed to increase the number of underrepresented students seeking geoscience-related degrees at UA.

The Saguaro program officially commenced on Sept. 1, 2009. Saguaro is an acronym for the Southern Arizona Geosciences Union for Academics, Research, and Outreach.

Much of the NSF funding will go to attracting and training minority undergraduate interns to do outreach at Tucson high schools and community colleges about geoscience careers and degrees. To reach minority high school students, Saguaro will partner with the UA Mathematics, Engineering, Science Achievement, or MESA, program, which already has a well-developed network of program coordinators and school advisors.



Phil Stokes, a geosciences doctoral student in the department of mining and geological engineering, is the program coordinator. He ran a successful similar program at the State University of New York at Buffalo while earning his master's degree in geological sciences.

One part of increasing involvement, said Stokes, requires the tearing down of a few stereotypes and misconceptions. "Kids often perceive geosciences as boring," he said. Going on fun field trips will be a part of the Saguaro program. In the successful OEDG program in Buffalo, Stokes took students fossil hunting at Niagara Falls, where they could see rock stratigraphy, and quite literally see geology in action. "Keeping kids in the class room and giving them a rock identification kit is not the answer," he said.