

## UM dorms will go 'off the water grid'

EurekaAlert

CORAL GABLES, FL. (November 03, 2010)—A \$2 million grant from the National Science Foundation (NSF) will allow the University of Miami (UM) College of Engineering to develop an autonomous net-zero water dormitory at UM. The project will make it possible for the residents to go "off the water grid," by using a sustainable approach to water collection, treatment and reuse.

The project entitled "Design for Autonomous Net-Zero Water Buildings" will be developed by an interdisciplinary team from UM led by James Englehardt, professor of civil, architectural and environmental engineering at the UM College of Engineering.

This project aims at promoting principles of sustainable development, explains Englehardt: "Conveyance of water and wastewater to and from centralized treatment plants consumes a large part of total US electric power generation. Our project takes advantage of new technologies to reduce energy and water demands by becoming autonomous, in terms of water use."

Over the next four years, the researchers will develop the self-sustaining system for converting all dormitory wastewater into potable water. The research team will build on current technologies that allow many functions of water monitoring, quality control, operation and maintenance to be decentralized, and develop a low-energy, direct potable reuse system with zero net water consumption. They will design new electrocatalyzers and filters to effectively destroy and remove contaminants common to homes without high-energy membrane treatment, investigate concepts of architectural and socio-cultural acceptability, and develop devices that "learn" how to detect health risk in real time. The water in the system will be used for all activities including bathing, washing, toilets, and laundry, with the exception of drinking and cooking.

"We asked ourselves what is the most resource-efficient system in the world? The answer is an ecosystem, because there is no waste," says Englehardt. "In contrast, in our society much of what we make and use eventually becomes a waste product. We can learn from ecosystems to close our loops by treating waste as a resource." When the project is completed in 2014, the system will service a total of 20 students. The design concepts developed will allow buildings of the future to respond in real-time to changing water conditions and to the needs of the people living there.

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