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SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Water From Space: Societal, Educational and Cultural Aspects (6)

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LAUNCH: WATER. TREES IN THE DESERT... AND SPACE?

Abstract

NASA, USAID, Department of State, and NIKE joined together to form LAUNCH – a global initiative to identify, showcase and support innovative approaches to sustainability challenges our society faces here on Earth. The hostile environment of space forces us to be creative in how we support human life both on and off our planet..

NASA hosted the inaugural LAUNCH:Water in March 2010 and LAUNCH:Health in October 2010. We chose water as a logical first LAUNCH topic because it's an issue we deal with on the International Space Station every day in orbit. Not only is water a critical commodity for our orbiting pioneers, but for so many living on our home planet.

"Water lies at the very foundation of NASA's reason for being. The search for life in the universe is a search for water, because life, at least as we know it, cannot exist without water." Mark Uhran, NASA's Office of Space Operations Deputy Associate Administrator for Space Station.

Mark Tonkin of DTI-r, one of our LAUNCH:Water innovators, is now a partner with NASA. We plan to fly his technology in space. His innovation, Subsurface Vapor Transfer Irrigation technology, may actually transform space travel one day. On Earth, subsurface irrigation technology enables agriculture to use water efficiently and also make use of brackish or saline water without the need for expensive purification, desalination, fine filtering or pressurizing. The innovative use of a unique hydrophilic DuPont material allows water vapor – which cannot carry salts – to diffuse through the pipe walls, while the contaminants are retained within the pipes. This process, known as pervaporation, is a combination of membrane permeation and evaporation. The ability of farmers to grow crops on previously non-arable land, and in a manner that uses little to no scarce freshwater has the potential to transform food production, increase water availability, reduce polluted run-off, improve soil quality, halt desertification, and address climate change issues. In addition, the ability of impoverished people to grow their own food could reduce their dependence on imports, gain economic independence, and improve their own health and well being. In space, the uses of this technology are mindboggling. Potentially, we can use a low-tech process to grow plants in space using wastewater. But, what if we could actually use this technology to purify water for consumption by humans onboard?