October 2009

A popular bumper sticker admonishes us all to “Save the Planet”. In terms of “Earth Time” (aka geological time) I have confidence that Planet Earth will survive any disturbances we see taking place today just fine. The living creatures on Earth are the components most in question and human beings are probably among the most vulnerable. Thus, the bumper sticker in question perhaps should read “Save the People”.

Human existence creates an impact on the full range of environments (native, agricultural, industrial, and urban) that we live in. Our existence and the ability of future generations to exist will depend on our capacity for understanding and managing these systems in a sustainable manner. Environmental science involves our efforts to better understand the impacts of human existence on the environment in which we live (and depend) and how we can better manage all systems in an environmentally sound and sustainable manner. Our general areas of focus and strength, Critical Zone Science and Water Quality are very good examples.

It is good for us all to think about how we define and apply a functional concept of environmental science to our work in this department and more importantly what we offer to the effective management of our immediate environments and our land and water resources. The application of good environmental science information is good for us all and good for “saving the planet” as well.

Jeffrey C. Silvertooth, Department Head

Featured Visiting Scholars

Nicole Emerstorfer
I am a visiting research scholar from the University of Natural Resources and Applied Life Sciences (BOKU) in Vienna, Austria, where I recently defended my PhD in Soil Physics. I am in Tucson for the second time this year. During my first visit at the SWES Department from March to June, I completed my PhD Thesis on “Quantifying Effects of Rock Fragments on Soil Hydraulic Properties and Groundwater Recharge by Means of Field Measurements and Numerical Modeling” under the supervision of Markus Tuller. After successfully defending my PhD in Austria, Markus offered me an opportunity to return to the SWES Department to work on the application of high-resolution thermal imaging and heat pulse technology for the prediction of evaporation rates from soils.

In my former life I studied landscape architecture. Upon completion of my Masters degree, I participated in a three-month internship at the Research Center CEMAGREF in Montpellier, France to work on direct planting techniques of irrigated winter crops under Mediterranean conditions. After returning to Austria, I accepted a research assistant position at the Department of Hydraulics and Rural Water Management at BOKU.

I am happy to be back in Tucson, enjoying the sun and of course working in Markus’s group.

Carlos M. P. Vaz
I am visiting research scholar from the Agricultural Instrumentation Center of the Brazilian Agricultural Research Corporation (EMBRAPA) in São Carlos, Brazil, spending a 12-month sabbatical with Markus Tuller and his group. I came to Tucson with my wife Rosinea, daughters Bruna and Júlia and my son Gabriel.

I have a bachelor degree in Physics and obtained MSc and PhD degrees in Soil Physics and Environmental Science, all from the University of São Paulo (USP). I have been working for EMBRAPA since 1989. My main interests lie in the...
development of simple and advanced methods for soil physical laboratory and field characterization, for both basic research and practical soil management and conservation purposes.

My joint project with Markus is focused on the application of micro X-Ray CT for quantification of water retention and soil pore and aggregate distributions. We also work on the characterization of particle size distribution at the sub micron scale with laser diffraction and atomic force microscopic techniques.

I am grateful that my family and I have the opportunity to spend time in Tucson and work in the SWES Department.

DEPARTMENT NEWS:

Be sure to see Dr. Ryan Sinclair and the SAGE Project video at http://uanews.org/ at U of A news on “Safeguarding the Water Supply”. This video highlights the work done at the Water Village on the development of real time sensors for water distribution systems.

A new version of the Proposal Routing Sheet (PRS) is posted: http://www.sps.arizona.edu/proposal/proposalroutingsheet.htm This change is in response to the new Conflict of Interest Policy, located at: http://www.vpr.arizona.edu/conflict-of-interest (effective July 1, 2009). On page 2 of the PRS, the following question appears for PIs/Co-PIs: “Have you filed a Report of Financial Interest with the OVPR?” The Report of Financial Interests Form is required for each proposal, and each investigator listed on a proposal. Send the completed/signed Report of Financial Interests forms to coi@email.arizona.edu (not to Sponsored Projects). If you have questions about the COI policy, please contact Mary Lovely at 626-7879, or lovely@email.arizona.edu. Please download and start using the new proposal routing sheet. It will be required as of September 1, 2009.

GRADUATE STUDENT NEWS:

Luisa Ikner (Gerba) was selected as one of ten graduate fellows for the 2009-2010 National Science Foundation/BIO5 BioME Program (Stipend: $30,000). She is working with 7th grade science students from Flowing Wells Junior High to foster hands-on inquiry-based skills while encouraging critical thinking in modern science and technology issues.


SWES REPORT CARD:

GRANTS:


PUBLICATIONS:


Megdal, S. AZ water planning, a glass both half filled and half empty. Arizona Water Resource, Summer 2009.


PRESENTATIONS:


Gerba, C. P., instructor at the fourth Annual Workshop on Quantitative Microbial Risk Assessment held at Michigan State University, East Lansing August 16-20.

LaComb, M., J.W. Neilson, and R.M. Maier. Comparative diversity of two hyper-arid regions of the Atacama Desert, how similar are they? Undergraduate Biology Research Program Summer Poster Session. UA, Aug. 6.


Megdal, S. Challenges to Sustainable Water Management. Udall Foundation Scholars Orientation, Tucson, August 7.

PLANE TALK FROM ERL
Ian Pepper

The Water Village now functions as a science and engineering center with a state, national and international reputation due to the state-of-the-art research that is conducted on various aspects of water and wastewater treatment and distribution. Over the next few “SWES Sounds” we will highlight some of this research.

One high profile project has involved the development of an assay to detect infectious prions. Normal prion proteins are found in the brains of humans and many other mammals including cows, sheep and mice, and have essentially a tertiary protein structure dominated by $\alpha$ helices. Abnormally folded prion proteins (beta sheet tertiary structure) result in transmissible spongiform encephalopathies (TSEs) that cause a group of rare but fatal neurodegenerative disorders known as “mad cow disease” in cattle and Creutzfeldt-Jacob disease in humans—it’s a scary disease. Our infectious assay for prions (the only such assay in the world) has allowed us to evaluate the fate of prions in water, wastewater and biosolids. Our studies have shown that “infectious” prions are not as stable as previously thought. This is because previous studies utilized “western blot” technology which detected the amino acid of the protein, but did not determine whether or not the protein was infectious. Hence we have shown inactivation of infectious prions in potable water and also during wastewater treatment. These studies have enormous public health implications. Chuck Gerba and Ian Pepper are the P.I.s on these projects; Kazue Takizawa obtained her M.S. degree based on this research; and Syreeta Miles is working on a PhD.

SWES Fall Chile Cookout --- 21 August 2009

Congratulations to the 2nd Annual Dessert Contest winner
--Marianyoly Ortiz-Ortiz