



# SWES SOUNDS



The Heartbeat of the Department of Soil, Water & Environmental Science

September/October 2010  
<http://ag.arizona.edu/SWES/>

Volume 29, Issue 3 Shantz Bldg. 38, Rm. 429  
Tucson, AZ 85721

## TONES FROM THE TOOTH

It is often true that the undergraduate degree program(s) that an academic unit supports is an honest reflection of its priorities, depth, and scope. That is certainly true in the case of the SWES Department and the Bachelor of Environmental Science (BES) degree program that this department has developed, directed, and maintained for almost two decades.



This Department was part of the Soil, Water and Agricultural Engineering Department until 1985 when the two units were split and the Soil and Water Science (SWS) Department was formed. The SWS Department immediately began to develop new programmatic directions and environmental science applications soon became a high priority area. In 1990 efforts began to develop an undergraduate degree program in environmental science (ENVS) and in 1993 the BES degree was approved by the Arizona Board of Regents and implemented. In that same time frame the Environmental Research Lab (ERL) was added to the department and the name was changed to Soil, Water and Environmental Science (SWES). Since 1993 SWES has invested entirely in the development and support of environmental science programs across the department in a very broad manner with the support of the ENVS degree program often serving as the hub of coordination among our faculty and programs. Every faculty position, both new and existing, must always be considered in terms of relevance and relationship to the environmental science focus for the department and accordingly the ENVS degree program.

The ENVS degree has always been considered to be a “university-wide” program because many of the required courses that are offered by departments throughout the University. However, SWES has always maintained full administrative and academic responsibility for the ENVS program. Efforts in the past to broaden the participation in this degree program to include other departments has been stymied by accounting procedures with the central administration and the natural “tribal” culture that commonly exists among academic units.

Recently with the inclusion of SWES in the School of Earth and Environmental Sciences (SEES) we have the opportunity to consider broadening the ENVS curriculum to include the

the other SEES academic departments (Geosciences, Hydrology and Water Resources, Atmospheric Science, and the Laboratory for Tree Ring Research) and also to include the Department of Ecology and Evolutionary Biology (EEB), the School Natural Resources and the Environment (SNRE), and Biosphere 2. This represents both an opportunity and a challenge for SWES. It is important for SWES to protect its extensive programmatic investment and commitment in the ENVS program, particularly at a time when the University is entering into the system of “Responsibility Based Budget Management” and departmental income will be directly related to Student Credit Hours (SCH), enrollment, and graduates from the program. However, it is also incumbent upon SWES to truly work in the spirit of the “university-wide” program it has developed and promoted for the past 17 years and to openly and progressively consider broadening the ENVS program to include the other SEES and ecology/environmental science related units. Accordingly, SWES needs to be alert to and fully engaged in this ENVS degree program review in an open and progressive manner. We look forward to and fully embrace the opportunity and challenge of this new prospect for the ENVS program and to work with the other SEES and ecology units in this effort.

Jeffrey C. Silvertooth, Department Head

## FEATURED GRADUATE STUDENT

Sidrotun Naim was born and raised in Solo City and comes from a long line of teachers in her family.



After graduating in 2002 from Bandung Institute of Technology (ITB), Naim worked as an environmental consultant for Freeport Indonesia in Papua on post-mining reclamation with native plants. In 2005 she earned a MS in Marine Studies from the University of Queensland in Australia with Dean’s commendation for high achievement. In 2006 she began working as a marine program consultant for World Wildlife Fund Indonesia in Aceh – the epicenter of the devastating 2004 tsunami. Here she met her future advisor, Dr. Kevin Fitzsimmons, and subsequently began her PhD studies at UA with the support of a Fulbright Fellowship and a UA graduate tuition award. In December 2009, she received the UNESCO-L’Oréal For Women in Science (FWIS) Award in Indonesia. Sidrotun was also the 3rd winner of Alltech Young Scientist in the US in May 2010. She points out: “I have learned from Dr.

Fitzsimmons that being a PhD student is not only about taking classes and running research. It is also how to communicate our research through scholarly articles and oral presentations, to write grant proposals, and to develop and manage networks.”

Sidrotun recently received the FFTF (Faculty for the Future) Award from the Schlumberger Foundation (2010/2011). The FFTF helps women from developing and emerging countries to study at the top universities in the world. The fellows are expected to return to their home countries in order to pursue their academic careers and serve as role models and inspiration for young women in science and engineering.

At UA, Sidrotun is studying aquaculture an important industry in Indonesia which contributes to food security, income and employment and it generates foreign exchange earnings. An important livelihood for coastal fishery communities (more than 6 million people in Indonesia, most of them women) it also contributes to reducing the pressure on marine natural resources. Sidrotun is researching the potential of a polyculture between shrimp and tilapia to reduce diseases in shrimp farming. She hopes that her aquaculture research will help improve the quality of life in coastal communities throughout her country.

## DEPARTMENT NEWS:

### Congratulations to following who have received major awards that we are proud to announce in this issue of SWES Sounds:

**Jon Chorover** was recognized on Nov. 9 as the recipient of the 2010 CALS Outstanding Research Faculty of the Year Award. Jon was presented with the award at the CALS Faculty/Staff meeting .



**Tom Wilson** was recognized with the CALS 2010 Faculty Teaching Award presented on Oct. 8 during the CALS annual Honors Convocation ceremony. This is the top teaching award in CALS.

**Sharon Megdal** was recognized as a member of the Board of Directors for the Central Arizona Project, which received the 2010 Leader of the Year award in the Government Category by the Arizona Capitol Times in Phoenix on Sept. 28.

**Rafael Martinez Garcia** attended, as a laureate fellow of the Norman Borlaug Leap Fellowship, the prestigious World Food Prize Award Ceremony which was held in Des Moines, Iowa from Oct. 10 to Oct. 15.

**Oscar Hernando Torres-Urquidy** was the 2nd place winner at the Graduate and Professional Student Council Student Showcase 2010 here at the University of Arizona.

**Jim Riley** has been invited to become one of six inaugural inductees into the Bart Cardon Academy of Teaching Excellence. The goal of this Academy is to promote, recognize, discuss and celebrate teaching excellence and to continually improve CALS academic programs. The Academy mission affirms that teaching is a significant intellectual/scholarly activity, and will advance models of teaching that foster deep and lasting understanding by students. Members of the Academy will provide a variety of services to the teaching mission of the College, including sponsoring teaching workshops, mentoring new faculty and Teaching Assistants, promoting and evaluating recipients of teaching awards, and generally providing guidance to faculty interested in improving their teaching effectiveness. In addition, Academy members will be asked to provide guidance to the Office of Academic Programs on faculty development and curriculum by providing advocacy, service and advice on teaching matters.

**Jose Chen-Lopez** received an Institute of the Environment Graduate Travel Award to attend the SSSA Meeting in Long Beach, CA.. Jose works with **Markus Tuller**.

**Pam Nagler** a SWES graduate and a current active adjunct and grad student advisor, has received a Presidential Early Career Award for Scientists and Engineers for her work in the USGS Southwest Desert Research Station with salt cedar on western US rivers. She was one of only three Department of the Interior scientists nationwide to receive this award.

~~~~~

**Earth Science Outreach Day:** Geosciences in collaboration with SEES hosted an earth science outreach day on Nov. 6 for local middle and high school students with UA MESA program. It is a variation of the Geosciences "Saturday Academy" outreach day hosted on campus last year, during which >100 students and their families and teachers rotated through a morning of hands-on activities. This year SWES joined in with a Soil texturing activity called "Soil Texturing: Using your hands to discover the world beneath you".



**SWES Facebook:** The SWES departmental Facebook page is now up and running. Check it out!

**Furloughs:** We would like to remind everyone of the furloughs hours or days that they must take this Fiscal Year 2010-2011. Also, please note that Faculty on academic contracts must take furlough days or hours between the dates of 16 Aug. 2010 and 22 May 2011.

The amount of furlough is based on annualized salary level:

- Employees making \$40,000 and below – not asked to take furlough
- Employees from \$40,001 to \$60,000 – 1 day (or 8 hours)
- Employees from \$60,001 to \$90,000 – 2 days (or 16 hours)
- Employees making \$90,001 and above – 3 days (or 24 hours)

Furlough hours will be prorated for employees who work less than 1.0 FTE.

## SWES REPORT CARD:

### GRANTS:

**Bright, K.**, M. Friedman, J. Fonesca, **C. Gerba**, D. Jaroni, K. Nolte, J. Patel, S. Ravishankar. Improving the Safety and Quality of Organic Leafy Greens: Assessment of Good Production Practices Along the Farm to Fork Continuum. U.S. Department of Agriculture, \$2,907,334.

McDermott, T., **C. Rensing**, G. Wang. Molecular Mechanisms of Microbial Arsenite Sensing and Gene Regulation of Heterotrophic and Chemotrophic Arsenite-Oxidizing Bacteria. The Chinese National Natural Science Foundation, \$290,000.

**Yoklic, M.** Development of Energy and Water Efficient Wood-Frame Housing in North Carolina. USDA, FS, Forest Products Laboratory, \$50,000, 2010-2011.

### PUBLICATIONS:

Brooks, J.P., **C.P. Gerba**, P.L. Gurian, **I.L. Pepper**, R.G. Sinclair. 2010. Pathogens and Indicators in United States Class B Biosolids: National and Historic Distributions. *J. Environ. Qual.* 39:2185-2190.

**De-Bashan, L.E.**, J-P. Hernandez, **K.N. Nelson**, **Y. Bashan**, and **R.M. Maier**. Growth of Quailbush in Acidic, Metalliferous Desert Mine Tailings: Effect of *Azospirillum brasilense* Sp6 on Biomass Production and Rhizosphere Community Structure. *Microbial Ecol.*, 60:915-927.

De Camargo, P.B., **J.L.M. Van Haren**, L. Hutyra, R.C. de Oliveira, N. Restrepo-Coupe, M. Keller, S.R. Saleska. 2010. Do Plant Species Influence Soil CO<sub>2</sub> and N<sub>2</sub>O Fluxes in a Diverse Tropical Forest? *J. Geophys. Res.-Biosci.*, 115, G03010 .

**He, M.**, X. Li, H. Liu, S.J. Miller, **C. Rensing**, and G. Wang. 2010. Characterization and Genomic Analysis of a Highly

Chromate Resistant and Reducing Bacterial Strain *Lysinibacillus fusiformis* ZC1. *J. Hazard. Mater.* Doi:10.1016/j.jhazmat.2010.09.072.

**Huete, A., Z. Jiang.** 2010. Linearization of NDVI Based On its Relationship with Vegetation Fraction. *Photogrammetric Engineer and Remote Sensing*, 2010, 76(8):956-975.

**Neilson, J.W., L. Zhang**, T.A. Veres, K.B. Chandler, C.H. Neilson, J.D. **Crispin, J.E.** Pemberton, and **R.M. Maier**. Heavy Metal Effects on Transcriptional Expression of rhlB/rhlC Genes and Dirhamnolipid/Monorhamnolipid Ratios. *Appl. Microbiol. Biotechnol.*, 88:953-963.

**Pepper, I.L.**, J.P. Brooks, R.G. Sinclair, P.L. Gurian, and C.P. Gerba. 2010. Pathogens and Indicators in United States Class B Biosolids: National and Historic Distributions. *J. Environ. Qual.* 39:2185-2190.

**Schaap, M.G., M. Tuller**, 2010. Quantitative Pore-Scale Investigations of Multiphase Bio/Geo/Chemical Processes. *Vadose Zone J.*, 9:573-575, doi:10.2136/vzj2010.0090.

### PRESENTATIONS:

**M. Tuller** et al. The Through Porosity of Soils as the Control of Hydraulic Conductivity. 19th World Congress of Soil Science, Brisbane, Australia, Aug. 1-6.

**M. Tuller, J. Walworth** et al. Novel Gradient-Based and Surface Chamber Techniques for Monitoring Regulated and Greenhouse Gas Emissions from Animal Feeding Operations. USDA NIFA AFRI Air Quality PD Meeting, Amarillo, TX, Aug. 23 -25.

Neilson, J.W., A. Legatzki, and R.M. Maier. The bacterial communities of Kartchner Caverns” who knew?! CaveFest 2010, Kartchner Caverns State Park, Nov. 13.

**Maier, R.M.** Microbial diversity and community structure in oligotrophic environments. 2010. Keynote address at the FertBio 2010 Conference, Guarapari, Brazil, Sept. 13-17.

**Maier, R.M.** Microbial diversity and community structure in oligotrophic environments. 2010. Universidade Federal de Vicosa, Minas Gerais, Brazil, Sept. 14.

**Pepper, I.** Global Potable Water Quality Research at The University of Arizona Water Village. Imperial College, London, England. Oct. 27.

**Rensing, C.** Copper Surfaces and their Effect on Bacteria. ICA Science Symposium. Paradise Valley, AZ, Jul. 22-25.

**Schaap, M.** Modeling Flow in a Deep Vadose Zone Using Hydraulic Parameters of Different Qualities. AGU’s “Meeting of the Americas.” Foz do Iguasu, Aug. 8-13.

**Silvertooth, J.** Soil management for maximum yields. Actagro Nutrient Seminar. Sacramento, CA, Nov. 4.

**Tuller, M.** Geophysical Characterization of Inactive Mine Tailings – A First Step for Revegetation. 7<sup>th</sup> Annual Symposium “Research Insights in Semiarid Ecosystems (RISE)”. Tucson, AZ, Oct. 2.

**Yoklic, M.** Resource Efficient Building: Integrating Net Zero Energy and Renewable Resources into High Performance Green Buildings. Southwest Renewable Energy Conference, Santa Fe, NM, Sept. 14-16.

**The following were presented at the Water Distribution Systems Analysis (WSDA) Conference, Tucson, AZ, Sept. 19-23:**

**I. Pepper et. al.** Real Time Monitoring for Pathogens in Water.

**Gerba, C., I. Pepper et al., K. Takizawa.** Survival of Infectious Prions in Water.

**The following were presented at the Annual International ASA, CSSA, and SSSA International Meeting, Long Beach, CA, Oct. 31-Nov. 4:**

**Babcock, E.** Soil Testing and Plant Analysis Relationships for Irrigated Chile Production

**Chen-Lopez, J.C., M. Tuller et. al.** Numerical Simulations of Root Zone Fluid Fluxes in Greenhouse Substrates.

**Ferré, T.P.A., M. Tuller et al.** Optimization of Border Irrigation for Salinity Control in Arid and Semiarid Regions.

**Ferré, T.P.A., M. Tuller et. al.** . The Soil Characteristic Curve at Low Water Contents: Relations to Specific Surface Area and Texture.

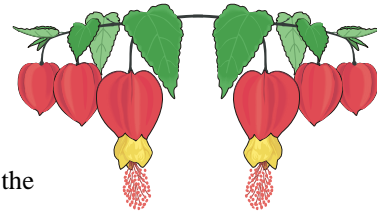
**Ferré, T.P.A., M. Tuller.** Monitoring the Seawater Interface with Simple Resistance Measurements.

**M. Tuller et. al.** Physicochemical Controls on Initiation and Evolution of Desiccation Cracks in Sand-Bentonite Mixtures: X-Ray Imaging and Stochastic Modeling.

**M. Tuller et. al.** Estimation of Evaporation Rates From a Subsurface Drying Front Using a Penta-Needle Heat Pulse Probe.

**Vaz, C.M.P., M. Tuller et. al.** Quantification of Phase Distributions in Porous Media with High-Resolution Benchtop Micro-CT.

**Levi, M.R., C. Rasmussen, et. al.** Assessment of Automated Image Segmentation for Predictive Soil Mapping.



**Vaz, C.M.P., M. Tuller.** Modeling the Influence of Water Content and Bulk Density on Soil Penetration Resistance.

**The following were presented at the Third International Conference on Drylands, Deserts & Desertification, Sede Boqer Campus, Ben Gurion University, Israel, Nov. 8-11:**

**Megdal, Sharon.** Quantifying and Funding Water for the Environment: How Researchers Assist Practitioners.

**Megdal, Sharon.** Stream Restoration in the Drylands: Success Stories from Arizona.

**Megdal, Sharon.** Water Management Complexities of the Lower Colorado River Basin: The Case of the Imperial Irrigation District Water Transfer to the Salton Sea.

---

## PLANE TALK

Ian Pepper, Director



The WET Center was one of the sponsors for an international conference held at the Hilton El Conquistador, September 13-15. The Conference entitled “Water Distribution Systems Analysis (WDSA 2010)” focused on research conducted on all aspects of water distribution systems. A total of 140 oral papers were presented with authors coming from all over the world representing 20 different countries. The Conference was extremely useful for the “Smart Water Distribution System” research currently being conducted at the Water Village. In addition, the Water Village itself was the focus of attention on the Wednesday afternoon when conference participants conducted a tour of the Water Village at ERL. The WDSA Conferences are held every two years, with WDSA 2012 being held in Adelaide Australia.

---

**Happy Holidays to All!**