



SWES SOUNDS

THE UNIVERSITY OF
ARIZONA
COLLEGE OF AGRICULTURE
AND LIFE SCIENCES

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

May/June 2009

Vol. 28,

Issue 2

Shantz Bldg. 38, Rm. 429

<http://ag.arizona.edu/SWES/> Edits were made to this document for web publication

Tucson, AZ 85721

TONES FROM THE TOOTH



In fall 2008 Provost Hay and President Shelton initiated a campus-wide "Transformation Plan" that has evolved into a rather extensive process. In October 2008 at least nine white papers (proposals) were submitted to the Provost's office proposing various reorganizations, mergers, consolidations, etc. Each of these nine white papers involved SWES either directly or indirectly.

SWES first engaged in a direct and serious consideration of forming a new School with two CALS units, the School of Renewable Resources (SNR) and the Office of Arid Land Studies (OALS). Following a thorough review, SWES, while recognizing several possible benefits associated with this option, voted not to join in this new School. We do, however, see good opportunities to continue to have productive collaborations with them.

SWES then considered and chose another option involving the formation of a School of Earth and Environmental Science (SEES) along with the Departments of Geosciences, Atmospheric Sciences, Hydrology and Water Resources, the Laboratory of Tree Ring Research, and the Accelerator Mass Spectrometer Laboratory, each residing in the College of Science (COS) (which is now becoming the College of Arts and Letters). SEES will function as a "federation" of these units and SWES. A very important aspect of the SEES is that each department will maintain its integrity and complete autonomy and SWES will remain in CALS.

I see three primary benefits from the formation of the SEES. First, we have an opportunity to better present ourselves to the world outside UA, both to prospective students and those seeking information regarding Earth and Environmental Sciences. Second, we can join forces in an effort to develop and deliver our curricula in Earth and Environmental Science. Also, SEES provides a good platform to identify and address future directions of our programs, where our fields are moving, and how we can better work together to build interdisciplinary strengths in these areas. In summary, the formation of the SEES offers some new and interesting challenges but it also offers some tremendous opportunities to change some of our traditional modes of operation and address some of our challenges more flexibly and creatively.

Jeffrey C. Silvertooth, Department Head

SWES REPORT CARD:

DEPARTMENT NEWS:

Markus Tuller (SWES) and **Ty Ferre** (HWR) taught an international course: "Merging Measurement and Modeling in Soil Physics" over spring break at the Research Center Foulum in Denmark. Thirty PhD students attended the course which focused on the need for a unified treatment of measurement and modeling in quantitative soil physics. The course was organized by the International Research School of Water Resources (FIVA) as part of the International Research Education Program for Soil Technology and Interdisciplinary Research in Soil and Environmental Sciences (STAiR). Other info: http://ag.arizona.edu/swes/soilphysics/stair_09.html



Our Congratulations To:

Julie Neilson, research scientist principal (Maier lab), was selected for the 2008 Fourth Quarter College of Agriculture and Life Sciences Outstanding Staff Award. She was honored at the Spring Faculty/Staff Meeting on Thursday, April 2.



Otakuye Conroy, postdoc (Rensing lab), has accepted a position as Assistant Professor in the Department of Civil and Environmental Engineering at the University of Utah.

Karis Nelson (Maier lab) won first place for an undergraduate presentation at the 48th Annual Arizona-Southern Nevada Branch of the American Society for Microbiology that was held in Tucson, AZ on April 4.

Monique Adakai, an undergraduate research scientist (ALEC) received the Morris K. Udall Foundation Scholarship. Her research focuses on the effects that pesticides and other contaminants have on insects such as bees.

Ian Pepper, Huruy Zerzghi, and **John** were the recipients of the 2009 Arizona Water Association Quentin Mees Research Award for their paper Sustainability of Land Application of Class B Liquid Biosolids in Arizona.

Congratulations to all May and August graduates:

Banerjee Monisha J., PhD
Berkompas Justin, MS
Jill M, MS
Finnerty-Rae Eileen C., PhD
Gomez-Pond Rae-Landa S, MS
Hernandez Mario, PhD
Travis W MS
Jeanne L., PhD
Jesus Humberto, PhD
Quaranta Davide, PhD
Soliz Deserie H, MS
Takizawa Kazue, MS
Maria Susana, PhD



And Congratulations to all SWES Undergrads:

David Richard
Chu Thi, Hong Hanh
Herman, Valerie Kristine
Hewitt, Jason Edgar
Alexis
Markus, Raymond Thomas
Nelson, Karis
Roy
Woodcock, Tara K.
Lincicome, Alexis Danielle



Agricultural Science and Technology Fellows Program (USAID). He will develop research projects and perform an internship at the World Fish Center in Penang Malaysia, Thailand and Luzon University in Philippines.

Alys Thomas was chosen to be a 2009/2010 NASA Space Grant Fellow for a second year in a row.

Richard Rushforth was awarded the Water Sustainability Program Fellowship Awards for the academic year, 2009-2010.

Monisha J. Banerjee (Ph.D., Pepper) successfully defended her dissertation "Title: Multiple approaches to the restoration of disturbed desert land".

Mario (Ph.D., Fitzsimmons) successfully defended his dissertation "Feeding of Niletilapia oreochromis niloticus and white shrimp Litopenaeus uannamei with different diets supplemented with Yucca schidigera and Quillaja saponaria extracts (saponins)".

Jeanne (Ph.D., Gerba) successfully defended her dissertation "Evaluation of the Occurrence and Risk of Microbes in Laundry and Laundry-associated Surfaces".

Jesus (Ph.D., Walworth) successfully defended his thesis "Nutritional Studies on Pecans Growing Under Irrigated Alkaline Soils".

Davide Quaranta (Ph.D., Rensing) successfully defended his thesis "Analysis and molecular characterization of an unusual copper inducible homeostasis mechanism in Pseudomonas putida KT2440"

Travis (M.S., Rasmussen) successfully defended his thesis "Digital soil-landscape classification for soil survey using ASTER satellite and digital elevation data in Organ Pipe Cactus National Monument, Arizona".

Deserie H. Soliz (M.S., Brusseau) successfully defended her thesis "Coccidioidomycosis and Particle Matter".

Maria Susana (Ph.D., Gerba) successfully defended her dissertation "Occurrence of Bacteria in Dishcloths used in Restaurants and Survival of Respiratory Viruses on Produce". She is returning to the University of Sonora in Hermosillo, Sonora, Mexico to a position as a Researcher in the Research and Graduate Food Department.

Where in the World are Dr. Gerba's people?

Jessica now works for Mid-Western

University in the Phoenix area.

Ellen works for Clorox as a research scientist

GRADUATE STUDENT NEWS:

Our Congratulations To:

Justin Berkompas (Brusseau lab) won 3rd place at the Water Sustainability Program Student Poster Competition.

Matt Levi, volunteer for Science Olympiad. Matt's team won first place in the "All Around" and in the "Environmental Chemistry" competitions! They will be going to the national contest in Augusta, Georgia on May 15-16. Matt has been helping these very bright students since early last fall.

Eun-Hae Kim (Rensing lab), won best graduate student presentation at the Arizona/Southern Nevada local ASM branch meeting in Tucson April 4th.

SWES grad students **Kyle VanderLugt and Rafael Martinez**, along with Eller grad student, Mauricio, were awarded a \$75,000 P3 Phase II grant as part of the EPA's Earth Day activities in Washington DC on April 20. The project is entitled "Recirculating Integrated Aquaculture and Agriculture System" and will be demonstrated with several indigenous communities in Tabasco and Chiapas, MX. Kevin Fitzsimmons serves as the faculty advisor on the project.

Rafael (Fitzsimmons lab) was awarded \$20,000 from the Leadership Enhancement in Agriculture Program (LEAP) of the Norman E. Borlaug International

Roberto recently moved to Dauphin Island Alabama to work with the U.S. Food and Drug Administration on seafood safety.

Kristi was promoted to Associate Professor with tenure in the College of Public, University of Texas at El Paso.

Joan was awarded the title of Distinguished Professor (Reagents Professor) from Michigan State University.

Payal completed the requirements for her Ph.D. and is now a postdoctoral fellow in the Department of Environmental Science at UC- Riverside.

Jeanette has moved to Wash. D.C. to become director of the USDA Institute Agriculture and Food Safety "Epidemiology and Food Safety Program".

GRANTS:

C. Rensing, Mechanism of action, International Copper Association, 2008, \$65,000

M. Tuller, M.G. Schaap, and A.C. Thomas, "Development of a Web-Based Soil and Environmental Physics Course: A New Approach to Distance Education". TRIF – Anyplace Access for Arizonans Initiative (AAA) \$ 87,963

M. Yoklic, E. Glenn and J. Riley, Long-Term Evaluation of RO Concentrate Management Using Halophytes, US Bureau of Reclamation, \$99,221

M. Yoklic, Integrating Sustainable Energy, Rainwater and SDL Wood Product into Affordable Housing in Cold Climates, USDA, FS, FPL, \$90,000.

PUBLICATIONS:

Bagai, I., **C. Rensing**, N.J. Blackburn, and M.M. McEvoy. 2008. Direct metal transfer between periplasmic proteins identifies a bacterial copper chaperone. *Biochemistry*. 47: 11408-11414.

Black, S., J. A. Thurston and C. P. Gerba. 2009. Determination of Ct values for chlorine of resistant enteroviruses. *Journal of Environmental Science and Health. Part A*. 44:336-339.

Elguindi, J., J. Wagner, and C. Rensing. 2009. Genes involved in copper resistance influence survival of *Pseudomonas aeruginosa* on copper surfaces. *J. Appl. Microbiol.* 106: 1448-1455.

Gerba, C.P. and C.Y. Choi. 2009. Water Quality. In: *The Produce Contamination Problem: Causes and Solutions*. G. Sapers, E. Solomon, and Karl Matthews. Pp. 105-118. Academic Press, San Diego.

Gerba, C.P. 2009. Cleaning up: Battling germs in school facilities. *School Business Affairs*. 75 (2):3-5.

Glenn E.P., C. Mckeon, V. Gerhart, P. L. Nagler, F. Jordan, J. Artiola. 2009. Deficit irrigation of a landscape halophyte for

reuse of saline waste water in a desert city. *Landscape and Urban Planning*. 89(3):57-64

Gundy, P. M., C.P. Gerba and I.L. Pepper. 2009. Survival of coronaviruses in water and wastewater. *Food Environ. Virol.* 1:10-14.

Jones, E.L., M. Gaither, A. Kramer, and C.P. Gerba. 2009. An analysis of water quality in the Colorado River, 2003-04; An investigation into recurring outbreaks of norovirus among rafters. *Wilderness and Environmental Medicine*. 20:6-13.

Jordan F.L., M.R. Yoklic, K. Morino, P. Brown, R. Seaman, E.P. Glenn. 2009. Consumptive water use and stomatal conductance of Atriplex lentiformis irrigated with industrial brine in a desert irrigation district. *Agric. Forest Meteorol.* 149:899-912.

Jordan, F.L., R. Seaman, J.J. Riley, and M.R. Yoklic, 2008. Effective removal of microbial contamination from harvested rainwater using a simple point of use filtration and UV-disinfection device. *Urban Water* 5:209-218.

Kuhlman, K.L. and A.W. Warrick. 2008. Quasilinear infiltration from an elliptical cavity. *Adv. Water Resources* 31:1057-1065.

Lazarovitch, N., A.W. Warrick, A. Furman and D. Zerihun. 2009. Subsurface water distribution from furrows described by moment analyses. *J. Irrig. Dr. Eng.* 135:7-12.

Nagler P., K. Morino, K. Didan, J. Erker, J. Osterberg, K. Hutline, and E. Glenn. 2009. Wide-area estimates of saltcedar (*Tamarix* spp) evapotranspiration on the Lower Colorado River measured by heat balance and remote sensing methods. *Ecolhydrology* 2: 18-33.

Pepper, I.L., C.P. Gerba, D.T. Newby, and C.W. Rice. 2009. Soil: A Public Health Threat or Savior? *Crit. Rev. Sci. & Technol.* 39:1-17.

Rensing, C. and B.P. Rosen. 2009. Biogeochemical cycles for redox-active metal(oids): As, Cu, Mn and Se In *Encyclopedia of Microbiology, Third Edition*, Moselio Schaechter, Editor-in-Chief. Elsevier, Oxford, UK. Vol. 3: 205-219.

Roberts, T.L., S.A. White, A.W. Warrick, and T.L. Thompson. 2008. Tape depth and germination method influence patterns of salt accumulation with subsurface drip irrigation. *Agric. Water Manage.* 95:669-677.

Stromberg J., M. Chew, P. Nagler and E. Glenn. 2009. Changing perceptions of change: The role of scientists in Tamarisk and river management. *Restoration Ecology* 17: 177-186.

Sviercoski, R, F., C. L. Winter and A. W. Warrick. 2008. Analytical approximation for the generalized Laplace equation with step function coefficient. *SIAM J. Appl. Math.* 68:1268-1281.

Warrick, A.W., A.C. Hinnell, T.P.A. Ferré and J.H. Knight. 2008. Steady state lateral water flow through unsaturated soil layers. *Water Resour. Res.* DOI:10.1029/2007WR006784.

Zerihun, D., A. Furman, C.A. Sanchez and A.W. Warrick. 2008. Development of simplified solutions for modeling recession in basins. *J. Irrig. Dr. Eng.* 134:327-340.

PRESENTATIONS:

The following were presented at the 48th Annual Arizona-Southern Nevada Branch of the American Society for Microbiology, Tucson, AZ, April 4:

Camilios Neto, D., R.M. Maier, J.W. Neilson, D.A. Mitchell, and N. Krieger. Rhamnolipid production by solid-state cultivation.

Nelson, K.N., A. Legatzki, and R.M. Maier. Magnificent speleothems in Kartchner Caverns: Are microbes involved?

Ortiz, M., A. Legatzki, J.W. Neilson, B.M. Pryor, L.S. Pierson, and R.M. Maier. Variability of speleothem microbial communities in Kartchner Caverns, Arizona.

Solis-Dominguez, F.A., and R.M. Maier. Growth promotion of *Prosopis juliflora* by mycorrhizal fungi in metalliferous desert mine tailings.

Zhang, L., J.W. Neilson, and R.M. Maier. The effect of fatty acid substrate chain length on rhamnolipid production by *Pseudomonas aeruginosa*.

~~~~~  
**Conroy, O., M.M. McEvoy, and C. Rensing.** Substrate Specificity of two RND Metal-transporting systems. Gordon Research Conference *Multi-Drug Efflux Systems*. March 22<sup>nd</sup>-27<sup>th</sup> 2009. Galveston, TX.

**Fitzsimmons, K.,** Technological and Market updates in the Tilapia Industry in 2008. VIV International Agriculture Fair in Bangkok, Thailand in March.

**Gerba, C. P.** Outcomes of Cleaning Measurement in Schools, Second Integrated and Measurement Symposium. Las Vegas, NV, February 18-20, 2009.

**Gerba, C. P.** Keynote address, Reinventing Hygiene for the 21<sup>st</sup> Century", Tufts University Infection Control Day, Tufts University Dental School. Boston, MA, March 4, 2009.

**Gerba C. P.** Keynote address, The Impact of Hygiene and Cleaning on Human Health, Coverall International Business Group Annual Meeting. Cancun, Mexico, March 10, 2009.

**Gerba, C.P.** Health and Hygiene in High Traffic Areas: and Public Places, Emerging Opportunities in Global Health and Hygiene. Atlanta, GA, April 8, 2009.

**Gerba, C. P.** and J. B. Rose. Modeling Virus Risks, Risk Analysis of Complex Systems for National Security Applications. Santa Fe, NM, April 7, 2009.

**Glenn, E.** Saltcedar water use, habitat value, and interactions with native riparian vegetation - implications for management. Arizona Riparian Council Annual Meeting. Camp Verde, AZ, April 16-18.

Jones, S.B., C. Yang, and **M. Tuller.** Soil Infiltration and Evaporation Determination using Heat-Pulse Measurements and Energy Balance Modeling. Spring Runoff Conference, Logan, UT, April 2-3, 2009.

**Kim, E. H., M.M. McEvoy, and C. Rensing.** Guided by thioethers: the RND way out for copper and silver. Gordon Research Conference *Multi-Drug Efflux Systems*. Galveston, TX, March 22<sup>nd</sup>-27<sup>th</sup> 2009.

Martín, M.A., F. San José Martínez, J. Caniego, **M. Tuller, A. Guber, Y. Pachepsky, and C. García-Gutiérrez.** Macropore

structures of discretized X-ray CT of undisturbed soil columns and long range dependencies. 1<sup>st</sup> International Conference "Challenges of Porous Media", Kaiserslautern, Germany, March 11-14, 2009.

**Pepper, I.,** invited member of the Earth and Atmospheric Sciences National Academy of Science panel for the National Research Council (NRC) Research Associateship Programs Review. NAS Beckman Center, UC Irvine, March 9-10, 2009.

**Rock, C.** Status of Generation, Reuse and Recharge of Treated Wastewater in Arizona; Evaluation of Programs, Data Sources and Utilization Opportunities. UA Cooperative Extension Brown Bag Series, Maricopa County, Phoenix, AZ, March 24.

**Rock, C.** Characterizing the Sources of Microbial Contamination: DNA Testing of Excessive *E. coli* in the Santa Cruz River, Tumacacori *NHP*. Santa Cruz Researchers Day, Tucson, AZ, March 27.

**Rock, C.** Draft TMDL for *E. coli* on the Upper Gila River: Future Directions for Microbial Source Tracking. Upper Gila River TMDL Public Meeting, Safford, AZ, April 8.

**Rock, C.** Water Recycling and Landscape Irrigation. Tucson Business Women's Association, Tucson, AZ, April 14.

**Rock, C., K. Riley, M. Hernandez** provided water quality education to Ag Day participants, including > 250 children and adults with hands-on strawberry DNA extraction. Arizona Ag Day, Superstition Farm, Mesa AZ. March 7.

**Rock, C.** Arizona NEMO Wet/Dry Mapping. Portal, AZ, March 20.

**Rock, C.** Arizona NEMO Wet/Dry Mapping for the Agua Fria River. Cordes Junction, AZ, April 18.

**Rock, C.** Maricopa Agricultural Center hosted Maricopa's first Arizona Project WET "Water Festival" helping to educate Arizona's youth through interactive learning and water related activities. April 21.

San José Martínez, F., J. Caniego, F.J. Muñoz, M.A. Martín, **M. Tuller, A. Guber, and Y. Pachepsky,** Singularity features of pore size distribution of structured soil columns. 1<sup>st</sup> International Conference "Challenges of Porous Media", Kaiserslautern, Germany, March 11-14.

**Silvertooth, J.C.** The Economics of Conservation. Arizona NRCS Winter Legislative Conf., Phoenix, AZ, Feb. 25, 2009.

**Silvertooth, J.C.** Fertilizer Management for Cotton in Arizona. Southwest Ag Summit, Yuma, AZ, March 12, 2009.

**Silvertooth, J.C.** Careers in Environmental Science, Amphip High School, March 25, 2009.

**Yoklic, M., Gerstle, S., Knaebe, M.,** The Carriage House: Evaluating Renewable Resource Integration for Net Zero Energy and Water in a Cold Climate. American Solar Energy Society. San Diego, CA, May 4-8 2008.

-----

| Sunday                                                                                              | Monday                                                                     | Tuesday                                                                                   | Wednesday                       | Thursday                                                                                  | Friday                                                                                                              | Saturday |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------|
| <h1>May 2009</h1>  |                                                                            |                                                                                           |                                 |                                                                                           | 1<br><b>ETRs Due at Noon TODAY</b>                                                                                  | 2        |
| 3                                                                                                   | 4<br>Seminar<br>Jill Fillar<br>and<br>Kazue Takizawa<br>3:00<br>Marley 230 | 5                                                                                         | 6<br><i>Last day of classes</i> | 7<br><i>No classes</i><br><br><i>SWES Faculty Retreat 8:30am</i>                          | 8<br><i>Finals Begin</i><br><br> | 9        |
| 10                                                                                                  | 11                                                                         | 12                                                                                        | 13                              | 14                                                                                        | 15<br><i>Finals End</i><br><br><b>ETRs Due at Noon TODAY</b>                                                        | 16       |
| 17                                                                                                  | 18<br>Summer Pre-Session Begins                                            | 19<br> | 20                              | 21<br> | 22<br>                          | 23       |
| 24                                                                                                  | 25<br><b>Memorial Day</b>                                                  | 26                                                                                        | 27                              | 28                                                                                        | 29<br><b>ETRs Due at Noon TODAY</b>                                                                                 | 30       |
| 31                                                                                                  |                                                                            |                                                                                           |                                 |                                                                                           |                                                                                                                     |          |

NEWSLETTER TEAM: **Raina Maier, Ph.D.**  
Editor

**Kristie Gallardo**  
Coordinator and Distributor

**Karen Josephson**  
Webmaster

\* For questions, comments, suggestions, or feedback [contact Kristie Gallardo at 621-7228 or gallardo@cals.arizona.edu](mailto:gallardo@cals.arizona.edu)

| Sunday                                                                                                                    | Monday                       | Tuesday | Wednesday | Thursday | Friday                                                                                     | Saturday                     |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------|---------|-----------|----------|--------------------------------------------------------------------------------------------|------------------------------|
| <h1>June 2009</h1>                       |                              |         |           |          |                                                                                            |                              |
|                                                                                                                           | 1                            | 2       | 3         | 4        | 5<br>   | 6<br>Summer Pre-Session Ends |
| 7                                                                                                                         | 8<br>Summer Session I begins | 9       | 10        | 11       | 12<br>ETRs Due at Noon TODAY                                                               | 13                           |
| 14<br>                                   | 15                           | 16      | 17        | 18       | 19<br> | 20                           |
| 21<br>Father's Day<br>Summer begins<br> | 22                           | 23      | 24        | 25       | 26<br>ETRs Due at Noon TODAY                                                               | 27                           |
| 28                                                                                                                        | 29                           | 30      |           |          |                                                                                            |                              |