



SWES SOUNDS

THE UNIVERSITY OF
ARIZONA
COLLEGE OF AGRICULTURE
AND LIFE SCIENCES

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

August 2007

Vol. 26,

Issue 8

Shantz Bldg. 38, Rm. 429

Tucson, AZ 85721

<http://ag.arizona.edu/SWES/>

TONES FROM THE TOOTH

Humans, particularly perhaps in western cultures, have not always focused on environmental resource conservation. In fact, history shows a pattern of exploitation in the relationship between human development and the environment. Sustainability, in terms of sustaining human populations in relation to environmental resources, has often either not been considered or has been considered in short-term time frames. The development of urban dominated populations has served to further disconnect society from the environmental resources we depend upon.

One of our challenges in this day and age is to develop better and more sustainable relationships between environmental resource management and the presently rapidly growing populations for the long-term. Thus, the connection between environmental science and agriculture and many other areas of resource management is extremely important. The trick is to develop and use economical and sustainable practices for harvesting resources from the environment while maintaining the environment as a safe and healthy place for our communities.

In this State and region, consistent with the land-grant mission, the UA, CALS, and the SWES Department are well positioned to integrate our teaching, research, and extension efforts in environmental science with the management of land, soil, water, and air resources in many areas of human interaction with the environment including agriculture, mining, construction, and the generation, treatment, and disposal of wastes.

Thus, the principle objective of research in the SWES Department is to enhance our knowledge base and understanding of basic mechanisms that are operative in environmental systems. We use this knowledge to educate the next generation of environmental scientists and equip them with the necessary tools to address the problems and issues of the future. Concurrently, we seek to provide public access to our knowledge and information through our Extension education programs.

Jeffrey C. Silvertooth
Department Head



FEATURED FACULTY

Dr. Alfredo Huete, Professor



My program and interests are in Remote Sensing and satellite-based applications to study the Earth's environment, primarily in soil-vegetation-climate interactions, and including such topics as drought, land degradation, the carbon and water cycle, and land surface transformations brought about by land use pressures, climate, and global change. As a Full Professor, I am involved in the teaching of upper division and graduate classes, such as Remote Sensing of Environment (SWES 453/553), Monitoring Biosphere Processes (SWES 573), and Advanced Topics in Remote Sensing (SWES595x). Every once in a while I also teach Basic Soils (SWES 200). I currently serve as Chair of the Remote Sensing and Spatial Analysis (RSSA) graduate interdisciplinary program, providing a minor option to students throughout the campus, from Anthropology to Optical Sciences and Arid Lands, etc.

For over 10 years, our 'Terrestrial Biophysics and Remote Sensing' lab (<http://tbrs.arizona.edu>) has been contracted by NASA to develop algorithms and satellite products to monitor the Earth's vegetative cover on a near-daily basis. This was primarily done for the Earth Observing System MODIS satellite sensor and has resulted in widely available, free to the public, satellite vegetation index time series data that have been used successfully by government agencies, NGO's, and the academic community to monitor forest health and fires, rangelands, urban areas, and water resources. Our products are increasingly being used in quantitative carbon growth models and evapotranspiration assessments. We are very encouraged by recent studies that have successfully "calibrated" our satellite data products, on a global scale, with eddy covariance flux tower measures of carbon and water fluxes. Given this success, we are now attempting to apply our algorithms to other satellite sensor systems, including those that have a continuous time series data record extending for 30+ years into the past. We also have a project to extend our research to the future National Polar-orbiting Operational Environmental Satellite System (NPOESS). Many countries are now launching their own environmental satellites, most recent are Egypt, Korea, and Thailand, and seek our help and expertise.

In the last few years, I have been quite involved in field and satellite research in the Amazon, as part of a Brazilian-led international program to better understand how the Amazon rainforest functions and to determine possible fates of the Amazon to climate change and increasing deforestation. Last year we made an important discovery and found that trees in the Amazon rainforest grow fastest not in the wet season, but in the dry, sunny part of the year. The rainforest maintains root access to deep soil moisture layers in dry periods and thrive with the increased levels of light in the dry season. This has contradicted many climate and ecosystem models, but has been verified by in situ flux tower measurements. This discovery further emphasizes the importance of preserving old-growth forest that is likely to be more resistant to drought. For example, such ancient forests have nearly disappeared in Indonesia resulting in massive fires during El Nino years, as the forests have lost their resistance to drought, and quickly dry out during dry periods. We are actively investigating other comparisons between the tropical forests of Monsoon Asia with those in the Amazon.

We expect to maintain and advance this very productive Amazon research program by integrating faculty research expertise on this campus with educational opportunities for our students. We recently were awarded a large 5-year NSF- Partnerships for International Research and Education (PIRE) grant with Dr. Scott Saleska in EEB as PI. This IGERT-like program for international research and training will fund an "Amazon-PIRE" collaboration between UA, Harvard, and University of New Hampshire on the US side and five University and governments units in Brazil, providing international research and education programs for US and Brazilian students in the Amazon.

SWES REPORT CARD:

AWARDS:

Dr. Kevin Fitzsimmons received a distinguished service award from the Egyptian Society for the Development of Fisheries Resources and Human Health.

GRADUATE STUDENTS:

Chris Haney successfully defended his doctoral dissertation entitled "Functional Analysis of the Cation Diffusion Facilitator ZitB from *Escherichia coli* and the Mercury Resistance Determinant MerE from *Ralstonia metallidurans*" under the guidance of **Chris Rensing**. Chris has recently accepted a position as Assistant Professor at Lander University/South Carolina. Congratulations!

PUBLICATIONS:

Brooks, J.P., S. Maxwell, **C. Rensing**, **C.P. Gerba**, and **I.L. Pepper**. 2007. Occurrence of antibiotic resistant

bacteria and endotoxin associated with land application of biosolids. *Can. J. Microbiol.* 53: 616-622.

Quaranta, D., R. McCarty, V. Bandarian, and C. Rensing. 2007. The copper-inducible *cin* operon encodes an unusual methionine-rich azurin and a queuosine reductase in *Pseudomonas putida* KT 2440. *J. Bacteriol.* 189: 5361-5371.

Yoklic M. (editor). Research Update on Long-term Testing of Reverse Osmosis Concentrate Management Using Halophyte Irrigation. published by ERL <http://www.metrowater.com//pdfs/ResearchUpdate.pdf>

PRESENTATIONS:

Fitzsimmons, K. presented "Evolution of Value Added Tilapia Products: How Egypt Can Become a Major Supplier for International Markets" as the keynote address at the Arab-African Fisheries and Aquaculture Conference, Cairo Egypt, June 28.

Maier, R.M. presented "Phytostabilization of mine tailings in arid and semiarid environments" at the Regional Science Council Seminar Series "Mining Issues in Region 9 - Status, Cleanup, and Research", San Francisco, CA, June 19

Silvertooth, J. Seminar, "Growth, Development, and Nutrient Uptake Patterns for Chile" at the New Mexico Chile Association's Conference on 21 June 2007. Las Cruces, NM.

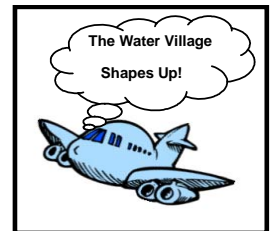
Yoklic, M. C. Daily, D. Confer, G. McCormick, K. Cesare. Rainwater Harvesting for Landscape: Panel. Desert Horticulture, 2007. Tucson, Arizona, May 18.

Yoklic, M. presented "Applied Research with a Long Term View: an Overview of ERL" and "Climate, Outdoor Thermal Comfort and Sustainability" at the Southern Arizona Branch of the US Green Building Council, Tucson AZ, May 16.

PLANE TALK FROM ERL

Ian Pepper, Director

The Water Village at ERL is starting to pay dividends from a science and technology perspective. The Water Distribution Network Laboratory (House #2), under the direction of Dr. Chris Choi (Agriculture and Biosystems Engineering) is doing state-of-the-art work in the area of contaminant dispersion and transport within potable water distribution system. Using a modular intermediate field scale test distribution network, Dr. Choi utilizes in-line sensors to develop test and validate models that predict the movement of



contaminants in water distribution systems. In turn, this data is utilized by Chuck Gerba to develop risk assessments relative to water contamination. Two research associates also work on this project: Dr. Ryan Sinclair and Dr. Inhong Song. To date the project has produced remarkable data that has resulted in major refinements of EPANET, and the model has been used nationally by EPA and water utilities to simulate contaminant transport in drinking water networks.

DEPARTMENT NEWS

We are pleased to announce the addition of Dr. **Channah Rock** to the Soil, Water and Environmental Science (SWES) Department faculty. Dr. Rock will join the SWES faculty as Assistant Professor and Extension Specialist in water quality and will be stationed at the Maricopa Agricultural Center. Dr. Rock recently completed her Ph.D. program at Arizona State University in Environmental Engineering with a specialty in Environmental Microbiology. Dr. Rock earned a B.A. degree from New Mexico State University in Microbiology in May 2003, and an M.S. degree from Arizona State University in Environmental Engineering in July 2005. Dr. Rock will develop a water quality research and extension education program that will complement the other fine programs that currently exist at the University of Arizona at the state and county level. Dr. Rock will assume her duties 1 August 2007. Please join us in welcoming Dr. Rock to the CALS faculty.

Please also join us in welcoming our new Office Assistant, **Lisa Spurlin**, to the Department Office. Lisa comes to us by way of Los Alamos National Lab where she worked in the Environmental Stewardship Division Office. Please send all future submissions for SWES Sounds to her at lspurlin@cals.arizona.edu

ANNUAL FALL CARNE ASADA

Mark your calendars now the Annual SWES Department Fall Carne Asada on **Friday, 17 August from 11:30-1:30pm**. We will gather at the **ERL Solar Oasis** for carne asada and all the trimmings. This is a chance to meet and greet and get your fill of wonderful food. Please call Lisa at the SWES Department Office (621-1646) with an RSVP.

BUSINESS OFFICE

Eddie Camacho

Open Enrollment will be held August 13 through September



**10
All**

benefit-eligible employees must re-enroll to ensure the continuation of benefit coverage after September 30, 2007

Changes made during Open Enrollment become effective October 1, 2007.

Employees must ensure their address information is current by logging into Employee Link. This imperative action will help ensure all benefit-eligible employees receive their annual Open Enrollment materials in a timely manner.

To update your address:

Login to Employee Link with your UA NetID and password

1. Select "Online Services"
2. Select "Update Employee Address"
3. Enter, save and confirm changes

If you do not know your UA NetID login information, please see your payroll representative, or call 621-HELP.

Flexible Spending Account Open Enrollment for 2008 participation will be held separately at a later date



FOOD FOR THOUGHT

Water trivia

<http://www.grinningplanet.com/2005/07-26/water-pollution-facts-article.htm>

- Water that enters an aquifer remains there for an average of 1,400 years!
- 40% of America's rivers are too polluted for fishing, swimming, or aquatic life.
- Even worse are America's lakes—46% are too polluted for fishing, swimming, or aquatic life.
- Two-thirds of US estuaries and bays are either moderately or severely degraded from eutrophication (nitrogen and phosphorus pollution).
- The Mississippi River—which drains nearly 40% of the continental United States, including its central farm lands—carries an estimated 1.5 million metric tons of nitrogen pollution into the Gulf of Mexico each year. The resulting hypoxic [coastal dead zone](#) in the Gulf each summer is about the size of Massachusetts.
- 1.2 trillion gallons of untreated sewage, stormwater, and industrial waste are discharged into US waters

annually. The US EPA has warned that sewage levels in rivers could be back to the super-polluted levels of the 1970s by the year 2016.



- In any given year, about 25% of beaches in the US are under advisories or are closed at least one time because of water pollution.

NEWSLETTER TEAM: [Raina Maier, Ph.D.](#)

[Lisa Spurlin](#)

[Karen Josephson](#)

<i>Sunday</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
<h1><i>August 2007</i></h1> 						
			1	2	3 	4
5	6	7	8 Last day of classes for 2 nd summer Session	9	10 ETRs Due at Noon TODAY	11
12	13	14 Faculty Meeting, FCS Rm. 219, 11:00 am-12:00pm	15	16	17 	18
19	20 Classes Begin for Fall Semester	21	22	23	24 ETRs Due at Noon TODAY	25
26	27 Fall '07 SWES Dept. Intro Seminar Dr. Silvertooth Marley Bldg. Rm 230 3:00pm	28	29	30	31 	

Editor

Coordinator and Distributor

Webmaster

* For questions, comments, suggestions, or feedback [contact Lisa Spurlin at 621-1646 or lspurlin@cals.arizona.edu](mailto:lspurlin@cals.arizona.edu)