Environmental Sciences Program

Fall 2003

ARKANSAS STATE UNIVERSITY

EVS NEWS

Understanding, Protection, Management & Use

Arkansas State University

Environmental Sciences Program

# EVS - Fall 2003

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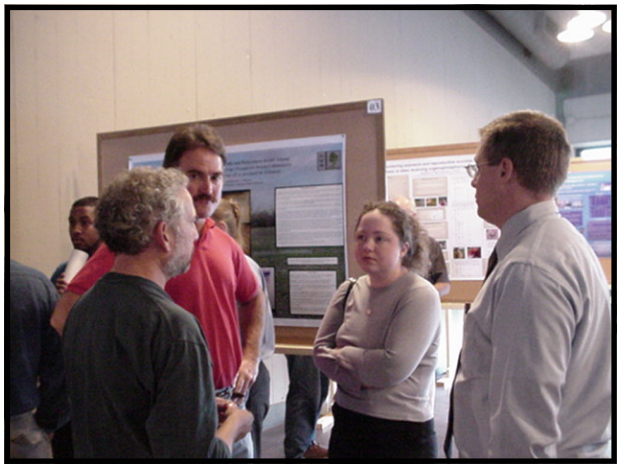

Fall has come and gone and the holidays were a pleasant break. The semester was filled with academic and social activities.

The first annual EVS Fall Preview was an event designed to introduce the students work to the local community, agencies, laboratories, and academia in an informal bluegrass music filled setting.

## DIRECTOR'S MESSAGE

Our world is increasingly a place of interactions. We might list recent headline notice of population increase, terrorism, water loss, species extinctions, and carbon dioxide increases as major problems that have at last grabbed the public's attention. Perhaps not in the sense that we've always recognized difficulties in dealing with hazardous materials, water quality and quantity, global losses, and biotic impoverishment, but rather, in a way that demands solutions that transcend the capabilities of a single discipline. It's interesting to reflect on the changing attitudes toward reductionist science as the norm, and the new movement towards integrative science as the exception. I recently realized that the writings a decade ago by a world-renowned scientist have come to bear. John Cairns lamented that with all the environmental crises in the world requiring the interaction of two or more disciplines, why hadn't the interaction and integration in the educational system and in the larger world occurred more frequently than it has. Our interdisciplinary program at ASU reflects both the benefits and difficulties in combining approaches to problem solving and training the "global environmental scientist". Perhaps the biggest challenge to this mix lies in continually adapting to ongoing change or small adjustments. I hope you'll enjoy reading about our recent challenges and changes and contact me if you'd like to review that paper by Cairns for a thoughtful treatment of your disciplinary constraints – or contributions as the case may be.

# NEW STUDENTS

Sam McCord, Ph. D. student, began his studies at ASU in the fall of 2002. He is originally from Missouri and received his B.S. and M.S. degree from Southeast Missouri State University in Zoology.

He is working with Dr. Richard Grippo and his dissertation research involves assessing the effectiveness of forestry management practices: benthic invertebrate surveys of adjacent streams. He has almost completed the baseline or "before" phase of the silviculture BMP bioassessment project. He is about to begin his second field season; his collection sites are located in the Ozark and Ouachita highlands and the Gulf Coastal Plains of southern Arkansas.

# ONGOING STUDENTS

Melissa S. Hobbs, Ph. D. candidate, received a B.S. in Wildlife from the U of A at Monticello and M.S. degree from the U of A for Medical Sciences in Occupational and Environmental Health. She is also a chemist with the U. S. Department of Agriculture, Agriculture Research Service in Stuttgart, Arkansas.

Dr. Richard Grippo is Melissa's advisor and her dissertation research project focuses on the fate and effects of the aquaculture therapeutant potassium permanganate. This project is funded by a three year grant from the U. S. Department of the Interior, U. S. Fish and Wildlife Service.

Phase one of the three year/ three phase project, on the effects of potassium permanganate on standard toxicity test organisms, has been completed. Phase two, assessing the fate and effects of this chemical in simulated aquaculture ponds is underway and should be completed by Spring 2004. Phase I description that the results of this phase were presented last month at the annual meeting of the Society of Environmental Toxicology and Chemistry in Austin, TX. The last project phase, assessing the toxicity of phase two pond effluent and sediment, is scheduled to conclude December 2004.

Peter Azah Abanda, Ph D candidate, is a member of the Water Rock Life Laboratory that is directed by Dr. Robyn Hannigan. His research interests include soil chemistry, black shale diagenesis and chemical weathering. He has recently defended his PhD proposal (December 3, 2003) describing his research project entitled "Thermal maturation of organic matter and its effects on the mobility of trace elements". Azah received the "Who's Who among students in American Universities and Colleges" award in recognition of outstanding merit and accomplishment as a student at ASU this semester.

Azah is originally from Cameroon and relocated to Jonesboro and ASU via South Africa in the Fall of 2001. He received his BSc. (Hons) degree in Geology from the University of Buea, Cameroon and his M.S. degree in Environmental Geochemistry from the University of Cape Town University, South Africa in 2001.

Azah's PhD research is in the field of Geochemistry. He is developing a chemical technique to isolate the fractions within black shale (carbonate, phosphate, sulfide, organic, silicate). After separating these fractions the elemental composition is measured by ICP-MS. The objective is to study the behavior of trace elements in organic rich sediments during early diagenesis. The isolation phase is near completion and he is currently analyzing the data and hopes to finish writing up his dissertation in December of 2004.

*"Larry Stauber's research focused mainly on agricultural resource management…"*

# CONGRATULATIONS: DR. LARRY STAUBER

Congratulations to the new Dr. Larry Stauber!

Dr. Stauber received his baccalaureates and master's degrees from the University of Arkansas, Fayetteville in 1987 and 1989. At the end of his master's degree he began his employment at the Cooperative Extension Services, where he is still employed today. In 1995 Larry Stauber started taking one or two classes higher-level biology classes per semester in the hopes that the Environmental Sciences Ph D program would become a reality. He began the Ph D program under Dr. Jerry Farris' advisement and Dr. Bill Baker took him into his GIS laboratory about three years ago (2000). Dr. Larry Stauber's main research focus concentrated on agricultural resource management; mainly on soil and water conservation practices his research project was entitled "The potential of GIS and hydraulic modeling for nonpoint source pollution reductions in Arkansas Delta agriculture."

ASU
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# Dr. Jerry Farris Receives the Eugene Kenaga SETAC Membership Award

Dr. Jerry L. Farris became the first recipient of the Eugene Kenaga Membership Award at the Society of Environmental Toxicology and Chemistry (SETAC) North America Annual meeting in Austin, Texas. This award was created in honor of one of the founders and the first president of SETAC, Eugene Kenaga. The award will be presented annually to a member instrumental in developing the society's membership at either the national or the chapter level.

Jerry has been a SETAC member since 1983, and has attended the past 20 SETAC North America Annual Conferences, author/ coauthoring 74 presentations at these conferences. Since 1989, he has sponsored over 28 different students for SETAC North America presentations and has been responsible for recruitment of over 40 student members at the regional and/or national level. As a founding member of Mid-South Regional SETAC, he has been instrumental in membership recruitment that has led to a 300% increase in regional membership since the inception of the chapter in 1995. Dr. Farris's involvement reaches beyond SETAC and into various state activities such as the Arkansas Environmental Federation (AEF), a society for industries' environmental awareness. Within this venue, he has sponsored student presentations at AEF's annual meetings, concurrent with recruitment of industries' participation and membership in SETAC at the regional and national levels.

Dr. Farris is a professor of Environmental Biology, Director of the Environmental Sciences Ph.D. Program, Director of the Ecotoxicology Research Facility, Chairholder of the Judd Hill Environmental Biology Committee, past member of the Arkansas Wastewater Licensing Board and member of the Arkansas Governor's Task Force for Water Quality. As a member of the Governor's Task Force, Dr. Farris strived to bring awareness to government concerning environmental problems of the state. His former students now represent agencies such as the Arkansas Department of Environmental Quality, United States Environmental Protection Agency, United States Department of Agriculture, various private industries and environmental consulting firms. Continued membership and activity within SETAC are common among his graduates. The spirit of the Eugene Kenaga award is exemplified through his multidisciplinary approach in recruiting students and professionals for SETAC membership.

The Eugene Kanaga Award was created in 2003 by the Society of Environmental Toxicology and Chemistry (SETAC) to honor the many contributions of Eugene Kenaga, one of the founders and the first president of SETAC.

*Dr. Jerry Farris is the first recipient of the prestigious Eugene Kenaga Award*

# NEW FACULTY

Dr. Andrew Knight, Assistant Professor of Sociology, relocated to Jonesboro and Arkansas State University from Canada via Maine, where he was a Thoreau Fellow for the 2001 academic year. Dr. Knight received his B.A. in Sociology from the University of Brunswick and his Master's degree in Sociology from the University of Western Ontario. His Ph. D. in Rural Sociology was conferred in 2002 at the Pennsylvania State University.

Here at ASU, Dr. Knight leads of the Center for Social Research Laboratory. The mission of the laboratory is to pursue both applied and theoretical research in the social sciences, train students, provide service to non-profit and public sector organizations, support the College and the University's missions, and be a forum for the dissemination of research through periodic technical reports and publication of findings. The laboratory houses 14 computers and 13 interviewer and 1 supervisor using Sawtooth Ci3 CATI for Windows, a highly versatile automated telephone interviewing system. All the surveys done on social issues have been run from the Center for Social Research Laboratory's facilities.

Dr. Knight's research interests are in the areas related environmental sociology. These areas include sustainable development, environmental movements, technology, risk perception, urban sprawl, community and social capital. His primary research interest lies in how the public and environmental activists view environmental and societal issues, how social institutions influence these views, and the relationship between attitudes and behaviors. Although, recently he has focused more on food safety and agricultural issues.

He, Patrick Stewart, Erin Bolin and Will McLean have just completed a project on tobacco use and regulations in Jonesboro. His on-going research projects include the study on social services in Jonesboro, the study on quality of life of Jonesboro residents and the Arkansas Biosciences Institute's research project on the social assessment of plant made pharmaceuticals. Dr. Knight is planning on starting a new project during the spring semester on environmental issues, for example attitudes toward waste management, he would appreciate any input on this matter from both faculty and students interested in this topic.

Dr. Knight would like to develop a 6000-level Environmental Sociology course in addition to a course covering topics in sustainable development.

*"Dr. Andrew Knight leads the Center for Social Research Laboratory"*

# OLD FACULTY: NEW FEATURES

Dr. Roger Buchanan, Associate Professor of Zoology, relocated to Jonesboro and Arkansas State University from The National Institutes of Health (Bethesda, MD) in 1992. Dr. Buchanan received his B.A. in Biology from the University of Delaware. The University of Delaware conferred his Ph. D. in Cell Physiology in 1990. From 1990 to 1992 he was a Post-Doctoral Fellow in the Laboratory for Neurobiology at the National Institutes of Health (NINDS). In 1992 he was awarded a Post-Doctoral Fellowship in Neurobiology at the Marine Biological Laboratory in Woods Hole, MA.

Dr. Buchanan's current research explores the effects of potential neuroactive compounds in the environment. For example, Dr. Buchanan and collaborators at UAMS, (Drs. Robert Skinner and Edgar Garcia-Rill) have putatively identified a novel site of action for nicotine. They along with postdoc Dr. Nori Mamiya, presented a poster "Novel Site of Action for Nicotine: Inhibition of Cholinergic Pedunculopontine (PPN) Output" at the 33rd Annual Meeting for the Society for Neuroscience. The conference held in New Orleans this past November. Additional data will be presented at meetings of the Associated Professional Sleep Societies and the Society for Research of Nicotine and Tobacco. Currently, Dr. Buchanan and Ph D student Katie McKeon are characterizing the effects of continuous nicotine exposure (using implanted osmotic pumps) and exposure to tobacco smoke on brain responses in rats. Dr. Buchanan is currently on sabbatical and is not teaching during the upcoming semester.

ASU ARKANSAS STATE UNIVERSITY

# FEATRURED INSTRUCTOR—

Dr. Robyn Hannigan is our featured instructor. She began her career at ASU in the fall of 2000 and became an Associate Professor of geochemistry in 2003. During her time at ASU, she has established the Water-Rock-Life Laboratory as a part of the Chemistry and Physics Department and the Environmental Sciences Program. Her laboratory has since gained much national and international recognition and is perceived as a Perkin-Elmer Major Research Instrumentation Center, because it serves as a testing center for new technology.

Dr. Hannigan received her baccalaureates degree in biology from the College of New Jersey and graduated with her first master's degree in geology from the State University of New York at Buffalo and with her second from the University of Rochester. She received her Ph D in Geochemistry from the University of Rochester in 1997. Thereafter she conducted postdoctoral research at Old Dominion University and Woods Hole Oceanographic Institute.

Dr. Hannigan is a traditionally trained geochemist and researches the forms of metals in the water and sediment of natural systems like rivers and estuaries in the US, New Zealand, Egypt, and Oman. Her work focuses on understanding the balance in between what Earth supplies to the environment and what humans mobilize. With her students (2 post-doctoral, 3 doctoral, 1 masters and 10 undergraduate) the laboratory maintains collaborative partnerships with scientists from the Institute of Geophysics and Geology in Moldova, The National Center for Nuclear Safety and Radiation Control in Cairo, Egypt, Environment Waikato in Waikato New Zealand, University of Ohio, and the University of Guelph, Canada.

The classes that Dr. Hannigan teaches at ASU are hydrogeology, geochemistry, environmental geology and biogeochemistry. During the spring semester she co-taught the Environmental Instrumentation class with Dr. Jon Russ.

Some of the WRL lab members in front of the ICP-MS.

*"Dr. Robyn Hannigan is the Captain of the Water Rock Life Lab, but also serves as the director for the RISE and McNair programs"*

# FEATURED STAFF— LORA HARDING

Lora Harding is our featured staff member this month. She is currently employed at the Ecotoxicology Research Facility as a research associate on a project entitled "Evaluation of the environmental fate and effects of the aquaculture therapeutic potassium permanganate." She performs a variety of chronic and acute tests on laboratory organisms, building baseline toxicity data for $KMnO_4$.

Lora received her A.A. in 1996 from Rich Mountain Community College in her hometown of Mena, AR. Lora relocated to Jonesboro to continue her education and received both her B.S. and M.S. degrees in Biology in 1999 and 2001 respectively. Lora started working at the ERF in 1998 as an undergraduate and has contributed to a number of projects throughout her tenure. Her thesis project was entitled "Assessment of instream conditions of two Deltaic streams receiving treated municipal effluent in Northeast Arkansas."

In her free time, Lora enjoys taking care of horses. Most of all, she enjoys camping and horseback riding with her family and friends.

# FEATURED LAB — MUSEUM OF HERPETOLOGY

Dr. Stan Trauth is the curator of the Museum of Herpetology at Arkansas State University. The laboratory mission is to develop a greater understanding and appreciation for native amphibians and reptiles in Arkansas and to promote regional herpetological research and conservation. The herpetofaunal collection (currently numbering over 28,000 voucher specimens) provides a foundation for ongoing research projects for undergraduate and graduate students. Recently, the laboratory has focused on maintaining a modern computerized collection, which supports all aspects of study on the natural history and conservation of herp species. The laboratory is also in the process of becoming noted by the Scientific Institution Collection.

The laboratory houses field research equipment such as digital cameras, GPS units, radio telemetry equipment as well as several boats. In house research equipment includes light, scanning and transmission electron microscopes and histological equipment including rotary microtomes, ultrotomes, hot plates, and slide warmers etc…

Currently there is one Ph. D. student, 7 master's students and 4 undergraduate students in the laboratory. The laboratory has also provided assistance and space for summer outreach program students (RISE). Several new masters students plan to join the laboratory next spring.

The members of the laboratory are currently conducting multiple research projects. Ben Wheeler and Waylon Hiler are working with the Ozark hellbender, a large aquatic riverine salamander, and its captive propagation, its regional status as well as its health within the rapidly changing riverine environments. Other species being studied by the laboratory are the western slimy salamander, Ouachita dusky salamander, Mississippi map turtle, colubrid snakes, and snapping turtles. As a group the laboratory has also been conducting herpefaunal inventories through funding from the Arkansas Game and Fish Commission, the U.S. Forest Service, the U.S. Fish and Wildlife Service, U.S. Army, and the National Park Service.

The laboratory will start multiple new projects in the spring. An undergraduate student will begin working on a herp restoration project in the Sylamore District, Ben Wheeler will create a herp database for Arkansas, Drew Reed will conduct a US Forest Service amphibian survey in North Sylamore Creek, and the Electron Microscope Laboratory (EM) will begin a collaborative project based on an ABI grant on nicotine and ephedrine interactions, where the laboratory will look at the effects on heart tissue in rats. In addition, a new book on Arkansas' herps is in press and is scheduled to be published in late spring.

*"The Museum of Herpetology Laboratory will begin multiple new projects during the spring semester"*

# RECENTLY PUBLISHED OR IN PRESS

- A.J. Mitchell and **M.S. Hobbs**. 2003. Effect of citric acid, copper sulfate concentration, and temperature on a pond shoreline treatment for control of the marsh ramshorn snail *Planorbella trivolvis* and the potential toxicity of the treatment to channel catfish. North American Journal of Aquaculture 65(4):306-313

- K. Trauth, G. Berry, W. Burns and **S. Reeve**. Accepted. Infrared Laser Spectroscopy of Jet Cooled Cobalt Tricarbonyl Nitrosyl. Journal of Chemistry and Physics.

**Stroud, B**. and Sanford, R. 2003. Master Plan Review in Resort Development: The case of Stratton Mounatin, Vermont. Pennsylvania Geographer.

**- Stroud, B**. 2003. Sun City. Encyclopedia of Recreation and Leisure in America.

**- Knight, A.** and R. Warland. 2004. Understanding the relationship between sociodemographics and concern about food safety issues. Journal of Consumer Affairs.

**- Lee, K.M** and **D.F. Gilmore**. 2004. Formulation and process modeling of biopolymer (polyhydroxyalkaoates:PHAs) production from industrial wastes by novel crossed experimental design. Process Biochemsirty of Elsevier (SCI Journal)

**- W.W. Stephens** and **J.L. Farris**. 2004. Instream community assessments of aquaculture effluents. Aquaculture.

ASU ARKANSAS STATE UNIVERSITY

# SHORT BUT SWEET - NEWS & ACCOMPLISHMENTS

- Anil **Baral** and Dr. Robert **Engelken** recently co-authored and presented the extended abstract "Optimization and Characterization of Electrodeposition of Trivalent Chromium from Amino Acid-Based Baths" at the Electrochemical Society's Annual meeting in Orlando, Florida. "

- Jennifer **Bouldin**, Bill **Stephens** and Jonathan **Maul** received travel awards from national SETAC.

- Jennifer **Bouldin** gave a poster and a platform presentation on vegetative and structural characteristics of agricultural drainages in the Mississippi Delta Region at the NA SETAC meeting.

- Dr. Robert **Engelken** made a presentation, "Balancing Rigor and Rapport in the Engineering Classroom: Where Should the Line be Drawn by New Engineering Educators" at the North American Society for Engineering Education's annual meeting in Nashville, TN.

- Dr. **Engelken** recently served as a reviewer for the new McGraw-Hill textbook, Classical and Modern Motor Control."

- Dr. Gauri **Guha** represented his colleagues from the College of Business and Ph D candidate Anil Baral at the International Meeting of the Allied Academics of Business in Las Vegas where he presented a paper entitles "The potential of Biotechnology: Promises, Perils, Perplexities—A survey of Impact on Relevant Economics Sectors and won the Distinguished Research Award."

- Dr. Richard **Grippo** gave two presentations at the SETAC meeting in Austin, Texas. 1) Effect of the Aquaculture Therapeutant Potassium Permanganate in Non-target Organisms. 2) Ten Years After: recovery of Alaskan Shorelines Impacted by the Exxon Valdez Spill and a presentation entitlesd Assessing the Effects of Forestry BMP protocols: Benthic Invertebrate Surveys of Adjacent Streams at the Southeast Silviculture Best Management Practices Task Force meeting.

**- Melissa Hobbs** presented the paper entitled "Responses of Non-target Organisms to aqueous Potassium Permanganate Exposure" at the North American SETAC meeting in Austin, TX.

- Dr. **Kwang-Min Lee,** one of EVS' first graduates, is now working on his postdoc researching proteomics and peptide overexpression from recombinant E.coli at the Korea Advanced Institute of Science and Technology (KAIST) located in Daejeon (approximately 90 miles south of Soul) Korea.

- Jonathan **Maul** presented two posters at the 24th Annual SETAC North America meeting in Austin, TX. The poster entitled "The effect of sex on avian plasma cholinesterase enzyme activity" won the 2003 Best Student Poster Presentation Award.

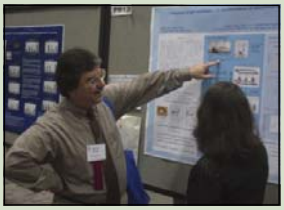
- Dr. Scott **Reeve** presented his research paper entitled "Infrared Diode Laser Spectroscopy of Pyridine in a 200 m Herriott Cell and a Supersonic Jet at the 38th Mid-west Regional Meeting of the American Chemical Society in Columbia, MO and at the 2003 Research Symposium in Fayetteville, AR.

- Dr. Aldemaro **Romero** signed a contract with Cambridge University Press to write a book titled The Ecology of Cave Fauna.

- Dr. Jon **Russ** was awarded a research grant from the National Endowment for the Humanities to study the chemistry of prehistoric rock paints from sites in Arkansas.

- Bill **Stephens** presented his research project entitled "Assessment of instream communities associated with nutrient contributions from aquaculture discharges in the delta ecoregion" and co-authored "Drainage ditch monitoring of the Delta Conservation Demonstration Center (DCDC), Mississippi, USA" at the national SETAC meeting in Austin, TX.

- Dr. Stan **Trauth** was an invited speaker to the department of biological sciences at the University of Memphis on October 2, 2003. He spoke about his on-going research on the nesting ecology of the western slimy salamander (*Plethodon albagula*) in an abandoned mine shaft in the Ouachita Mountains.



Dr. Richard Grippo judging a poster at SETAC.

*"Dr. Kwan-Min Lee is now working on his postdoc at the Korea Advanced Institute of Science and Technology (KAIST)."*

Please send suggestions and comments to:

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**THE EVS MISSION**

*To produce scientists with the knowledge needed to support the assessment, maintenance and recovery of environmental resources. This includes an appreciation of the economic, social, political and aesthetic context that shapes our interaction with and knowledge of the environment. Measuring and understanding the balance between environmental protection, sustainable resource management, and economic growth is a major integrating theme within the program.*

***HELP SAVE A TREE - If you would like a electronic copy of the newsletter contact Sonja Bickford (sbickford@astate.edu)***

# JON MAUL'S DISSERTATION DEFENSE

Congratulations to Jonathan Maul who defended his dissertation on Friday, December 17, 2003. His parents David and Linda Maul surprised him by attending the presentation from their hometown in Eastport, New York. Rebecca has been there all along.

*Picture (from right) David, Jonathan, Rebecca, and Linda*