EEES NEWS

Student News — Summer, 2010

John Kroon, a Hydrogeology graduate student, has been selected as the 2010 recipient of the Donald A. and Mary O'Nesky Named Grant of the American Association of Petroleum Geologists. This AAPG Grants-in-Aid award is made in support of John's thesis research, "Molecular Biogeochemistry of Lower Huron and Cleveland Shales in Eastern Kentucky and Southern West Virginia."

The Donald A. and Mary O'Nesky Named Grant is awarded annually to a deserving graduate student through the American Association of Petroleum Geologists Grants-in-Aid program, and is endowed by the AAPG Foundation with generous contributions from Don's many friends and associates.

Ben Sharp, an EE&S Ph.D. student, was selected as one of the recipients of the prestigious 2010 EPA STAR Fellowship. Dr. Shelie Miller serves as his research advisor; Dr. Mark Schlautman serves as his academic advisor.

CONGRATULATIONS!!

The following students have received Departmental Awards:

Christina Anderson	A. Ray Abernathy
Andrea Hicks	L. G. Rich
Ting Shao	Environmental Scholar
Shanna Estes	Environmental Scholar
Adam Mangel	Environmental Scholar

Darryl Jones received the best student thesis award from the American Water Works Association at its Annual Meeting in Chicago. Darryl and **Dr. Tanju Karanfil**, his advisor, were recognized with plaques, and Darryl also received a $3,000 check. Darryl was not able to attend due to illness.

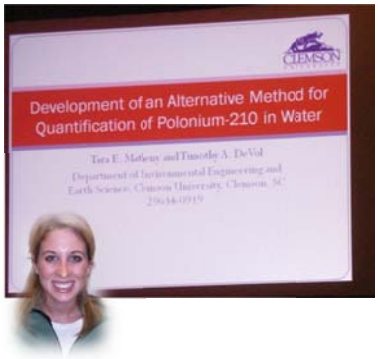
Andrea Hicks was awarded a travel grant to attend the North American SETAC meeting in Portland, OR in November where she will be presenting her research titled *"Greenhouse Gas Emissions from Small-Scale Conventional Wastewater Treatment"*

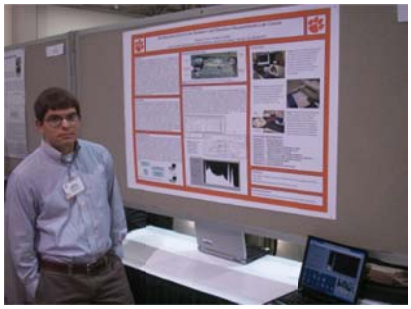
Viet Dang gave a platform presentation "Chiral Signatures in Passive Samplers Support a Better Understanding of Transformation of Contaminants in Water" at the 240th American Chemical Society Meeting held in Boston on August 26th.

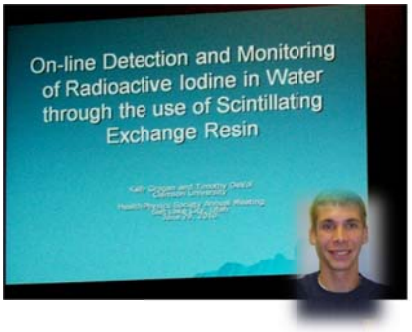
Sam Sarkar, **Jim Chamberlain** and **Dr. Shelie Miller** had the following article accepted for publication in the Journal of Industrial Ecology: It was the culmination of work done with an EPA P3 grant that they won in 2007: *"A COMPARISON OF TWO METHODS TO CONDUCT MATERIAL FLOW ANALYSIS ON WASTE TIRES IN A SMALL ISLAND DEVELOPING STATE"* Saumya (Sam) Sarkar, Jim F. Chamberlain, and Shelie A. Miller.

Jose Alfaro, **Ben Sharp** and **Jim Chamberlain** attended the Gordon Research Conference on Industrial Ecology, July 10-16. Jose's poster presentation won a student poster award. His poster was entitled: "Benefits of Using Industrial Ecology in Community Development Projects: A Case Study in Liberia West Africa".

Tara Matheny, **Kelly Grogan** and **Derick Kopp** gave presentations at the annual Health Physics Society in Salt Lake City in July.







Christopher Patterson has been named one of seven (7) students nationally who have been named NAGT Outstanding TAs for 2010. This is the largest selection of winners in some time because of all the great nominees received. Congratulations Christopher and all the other honorees for this year. For more information on this award, please visit http://nagt.org/nagt/programs/ta.html).

Student and Faculty Presentations at Goldschmidt 2010 International Conference

Michael Lilley, **Todd Miller**, and **Trevor Zimmerman** all gave presentations at the annual Goldschmidt Conference. This is an international geochemistry conference which was held in Knoxville, TN June 13-18th.

Zimmerman, T. N., Powell, B. A., "Plutonium Humic-Acid Stability Constant Determination and Subsequent Surface Complexation Studies" Goldschmidt 2010, Knoxville, TN, June 2010.

Lilley, M. S., Powell, B. A., Kaplan, D. I., "Sorption of Np, Pu, Tc, and I to Saltstone and Cement Formulations under Oxidizing and Reducing Conditions" GoldsShmidt 2010, Knoxville, TN, June 2010.

Miller, T. J., Powell, B. A., Kaplan, D. I., "A Simplified Quantitative and Conceptual Model of Np Sorption to Natural Sediments" Goldschmidt 2010, Knoxville, TN, June 2010.

At the Goldschmidt conference, **Dr. Brian Powell** also gave an invited lecture titled "Modeling actinide interactions with minerals and microbes" in the symposium "Transformation of Radionuclides by Microbes and Minerals".

Dr. Tanju Karanfil's Research Group made several presentations at the 2010 International Carbon Conference in Clemson, July 2010:

Zhang, S., Shao, T. and Karanfil, T. (oral)"Adsorption Site Analysis for Carbonaceous Adsorbents,"

Shao, T., Zhang, S. and Karanfil, T. (oral) "Adsorption of Organic Chemicals on Carbon Nanotubes in Aquatic Environment"

Zhang, S., Shao, T. and Karanfil, T. (poster) "An Empirical Equation to Relate the Adsorption Affinity and Structural Characteristics of Carbonaceous Adsorbents,"

Shao, T., Zhang, S. and Karanfil, T. (poster)"Are Carbon Nanotubes Promising Adsorbents for Water Treatment?"

Kose, S., Zhang, S. and Karanfil, T. (poster) "Pore Structure and Adsorption Affinity of Activated Carbon,"

Kose, S., Zhang, S. and Karanfil, T. (poster) "Surface Chemistry and Adsorption Affinity of Activated Carbon,"

Dr. Tanju Karanfil's Research Group also made the following presentations:

Jones, D.B., Saglam, A., Triger, A., Song, H. and Karanfil, T.(oral) "Iodo-Trihalomethane Formation from Pre-oxidation and Chloramination of Waters Containing Bromide and Iodide," American Water Work Association DBP Webcast.

Zhang, S., Shao, T., Kaplan, S., and Karanfil, T. (oral) "Aggregation and Adsorption Properties of Carbon Nanotubes in Aquatic Environments," *International Conference on Particle Separations and Nanoparticles in Water*, Durham, North Carolina.

Shao, T., Zhang, S., and Karanfil, T. (poster), "Application of Carbon Nanotubes for Removal of Organic Chemicals from Water," International Conference on Environmental Effects of Nanoparticles and Nanomaterials: Nano 2010, Clemson.

Engineer's Without Borders: Liberia

For Clemson's chapter of Engineers Without Borders, the summer of 2010 began with two international trips to west Africa and Central America. **Jose Alfaro** led a group of 10 students and 1 adult to Liberia where they established an integrated rice-fish pond for growing tilapia and rice, repaired a a rabbit nursery, built a peanut sheller, and taught local villagers how to construct an anaerobic digester for sustainable production of fuel.

Engineer's Without Borders: El Salvador

Jim Chamberlain led 7 students and 6 adults to El Salvador to continue design of a potable water system extension to several villages. The students surveyed for the new water lines and drilled a test well using a manual rotary drill rig that was donated to the local villagers. **Dr. Mark Schlautman** is a co-advisor for the group and Christina Anderson is the graduate student coordinator for two ongoing Creative Inquiry classes that continue to offer these excellent opportunities to undergraduate engineering students.

Ben Sharp and **Jose Alfaro** placed in their categories at the Greenwood Festival of Flowers International Distance Triathlon. Ben placed second and Jose third in the Male Novice categories. This was both of their first international (Olympic) distance triathlons.

Both of them have been training with a new team of athletes from our very own EEES department called the Life Cycle Armada. They train for diverse number of events including triathlons, bike and running races.

Arika Bridhikitti, Thomas J. Overcamp, and Patrick D. Gerard, Ozone Measurement Instrument (OMI) Sensor for Biomass-Burning Aerosol Optical Properties, Annual Meeting of the Air & Waste Management Association, Calgary, Alberta, June 22-25, 2010.

Arika Bridhikitti, Thomas J. Overcamp, and Patrick D. Gerard, Remote Sensing Observations of SE Asian Forest-Fire Aerosols' Optical Properties and Their Limiting-Factors, Annual Meeting of the Air & Waste Management Association, Calgary, Alberta, June 22-25, 2010.

Both **Shanna Estes** and Alan Jones in **Dr. Carraway's** group received travel grants to make their presentations at the SETAC meeting in November in Portland.

Andrea Kirchoff was married on May 15th, 2010 at St. Andrews in Clemson. Now she is Mrs. Andrea Hicks. CONGRATULATIONS!

Lara and Joshua Hughes have a new addition to their family!

The Environmental Engineering and Earth Sciences Welcome Back Picnic



Welcome New Graduate Students

Ademola Bakenne
Katelyn Bryll
Yang Cao
Dan Carey
Laura Daniels
Jaclyn Ellerie
Jordy Ferguson
Clay Freeman
Sudershan Gangrade
Noel Garland
Holly Garrett
David Hahn
Brittany Heisler
Lee Hering
Longchau Hoang
Salmatta Ibrahim
Joseph Jablonski
Chen Jiang
Yogendra Kanitkar
Daniel Lewis
Pooja Mahajan
Pooja Misey
Joleyn Nesbitt
Erasmu Oware
Hilary Palmer
Jovan Popovic
Neeraja Ramasubramanian
Berley Rister
Sarah Rudy
Laura Simpkins
Glenn Skawski
Megan Smith
Vladimir Soto
Muriel Steel
Ying Sun
Ty Taylor
Ryan Trogstad
Habiullah Uzun
Peter VanHeest
Jennifer Wong
Peng Xie

CONGRATULATIONS GRADUATES AND GOOD LUCK WITH YOUR FUTURE!!

May 2010

Vijai Elango
Jessie Cannon
Ben Carlisle
Amer Kanan
Rong Zhang
Trevor Zimmerman
Shannon Thompson

August 2010

James Cooper
Joel Kohn
Selcen Kose
Dan Matz
Will Nading
Ting Shao
Bin Yang

EEES Class of 2010
Faculty, Staff and Graduate Students

GEOL 370 Class Visits Grand Canyon

Dr. Richard Warner and **Mr. Scott Brame** of the Department of Environmental Engineering and Earth Sciences recently took 14 Clemson University students plus one visiting scholar from Korea to northern Arizona and southern Utah for their Maymester class, GEOL 370 – Western US Field Study. The purpose of the class was to experience first-hand the spectacular geology of the Colorado Plateau of the southwestern US. After flying to Las Vegas, Nevada on May 10, the class spent the next nine days exploring a wide variety of geologic features. They started in Zion National Park in southern Utah, camping there two nights, and ended at the north rim of Grand Canyon National Park for the last two nights. In between the class visited Monument Valley, Petrified Forest National Park, Meteor Crater, and several national monuments. Students saw massive sandstone cliffs; marvelous canyons (including Antelope Canyon, a narrow slot canyon); mesas, buttes and spires; and a volcano (Sunset Crater) that last erupted only 800 years ago. In Zion they climbed 1,500 feet to the top of Angel's Landing (the last bit holding onto chains bolted into the rock), while at the Grand Canyon they hiked more than 3,000 feet down into the canyon to Roaring Springs. In 2012 we plan to offer GEOL 370 again, featuring visits to Arches, Canyon lands, and Bryce Canyon National Parks and Natural Bridges National Monument, all in central and southern Utah.

Our condolences to **Mary Shirley** for the loss of her father; **Dr. Larry Murdoch** for the loss of his mother; and **Dr. Mark Schlautman** for the loss of his father. Our thoughts are with each of you.

Our Condolences also go to the family of Dr. Harvey Ludwig.
Dr. Harvey Ludwig passed away at the age of 94 on April 24, 2010. He was in the Public Health Service in Washington; he was instrumental in bringing to Clemson thousands of research and training grant dollars for the support of Clemson's fledgling Environmental Engineering program. Dr. Ludwig's reputation to the water environmental movement is world renowned.

Welcome New Faculty!!

EEES welcomes Dr. David Ladner and Dr. Kevin Finneran to the department.

David A. Ladner comes to us from Arizona State University where he was a postdoctoral scholar with Paul Westerhoff in the School of Sustainable Engineering and the Built Environment.

Dr. Kevin Finneran joins us from the University of Illinois at Urbana-Champaign Department of Civil and Environmental Engineering where he was an Assistant Professor.

Dr. Leslie Grady was selected as the recipient of 2010 Industrial Water Quality Lifetime Achievement Award from Water Environment Federation. This award is an excellent and well-deserved recognition for all of the work his research group did in trying to understand the factors controlling the biodegradation of synthetic organic compounds as well as the work the industrial water quality group at CH2M HILL did in putting this knowledge into practice. This is only the second year that this award has been given. Les will receive his award at the 2010 WEFTEC meeting in New Orleans.

The U.S. Department of Homeland Security will make two new nuclear forensics awards to EEES radiochemistry program. This includes a three year $300,000 education award to develop nuclear forensics teaching capabilities led by **Dr. Tim DeVol** and another three year $300,000 junior faculty award which goes to **Dr. Brian Powell** for his research efforts. Both of these awards were a result of a national competition, and they are effective September 1, 2010.

Drs. Larry Murdoch and **Stephen Moysey** were selected by DOE to study CO_2 storage with a grant in the amount of $450K for 3 years. They plan to apply reservoir deformation techniques, developed in part at the Clemson well field, and high-performance computing to CO_2 sequestration and possibly oil and gas production as well. This is an excellent continuation of the significant progress on CO_2 sequestration research being made in the department. More info about this project can be found at: http://www.energy.gov/news/9333.htm

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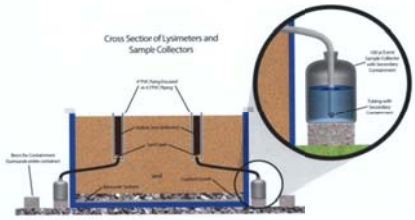
Dr. Stephen Moysey has received two grants from the DoD totaling $400k to investigate the influence of soil moisture on the detection of abandoned landmines using ground-penetrating radar (GPR). Included in the project is the purchase of a very unique GPR system that will place Clemson as a national leader in subsurface imaging. This basic science research has important military and humanitarian applications as abandoned landmines injure or kill thousands of people around the world every year.

Dr Larry Murdoch received a new grant (~$250k) from the National Science Foundation to evaluate how hydrologic processes alter the state of stress in the subsurface. The investigation will provide the scientific basis for new field techniques, theoretical analyses and instrumentation that will advance the ability to measure stress change in the subsurface—basically this amounts to placing a sensitive scale underground to measure small changes in the weight of the overburden. Applications include improvements in the ability to characterize key aspects of the hydrological cycle over scales from less than 1 m to greater than 100 m. The techniques could be used to improve: calibration of hydrologic models, validation and calibration of satellite instruments and algorithms; estimates of melting or accumulation of snow pack or glaciers; assessment of rates of erosion or sediment deposition; reduction of noise and resolution of tectonic strain; assessment of rates of carbon storage; methods for scheduling irrigation; understanding mass changes resulting from forest fires, and related. Hydro student **Clay Freeman** is working on the project and he already has prototype sensors under development.

Dr. Tanju Karanfil received a new research award entitled "Quantitative Structure-Adsorbability Relationships for the Adsorption of Organic Chemicals by Carbon Nanotubes" ($320K / 3 years) from the National Science Foundation's Chemical, Bioengineering, Environmental and Transport Systems (CBET) division's Environmental Health and Safety of Nanotechnology Program.

Dr. Shujuan Zhang, a postdoctoral research associate in Dr. Karanfils' group, has been a major contributor in the preparation of the proposal.

Long-term Field Lysimeter Project to Begin at Savannah River Site



Dr. Daniel Kaplan (Senior SRNL Scientist and EEES Adjunct Faculty Member) will begin a series of long-term, large scale field lysimeter experiments which will examine the mobility of key radionuclides under natural conditions at the SRS. **Dr. Fred Molz** and **Dr. Brian Powell** are collaborating on this project where over 50 field lysimeters will be exposed to ambient conditions for 1 to 10 years. This work builds on the highly successful mini-lysimeter project started in the 1980s at the SRS which has resulted in numerous collaborations with faculty and students at Clemson and has generated several thesis, dissertations, peer reviewed publications, and sponsored research projects.

Dr. David Freedman is starting a new project on anaerobic biodegradation of 1,4-dioxane. The sponsor is Hargis and Associates, a consulting firm based in San Diego, CA. **Francisco Barajas** is the graduate student working on the project

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NSF has funded a nanoparticle proposal lead by O. Thompson Mefford (PI), Chris Kitchens, and **Dr. Brian Powell**. The objective of the proposal is to define the potential source term of nanoparticles in natural systems to be used in a quantitative risk assessment. This will be achieved by quantifying the rate and extent of physical and chemical changes in nanoparticles during transitions from engineered to natural systems as indicated by the behavior of nanoparticles when released into natural waters. The award is for $525,000 over the four year duration of the project.

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Dr. Tanju Karanfil has served in the local organizing and technical committees of two major International Conferences held in Clemson this summer: Carbon2010: International Carbon Conference and Nano2010: International Conference on Environmental Effects of Nanoparticles and Nanomaterials. He also chaired several technical sessions at these meetings.

Here is a photo of **Dr. Cindy Lee** near the Kelso sand dunes in the Mojave National Preserve in California in July. On vacation this year, Dr. Lee traveled with a friend to Lake Tahoe by way of several interesting places in the western US.

Steve Cawood recently gave $150,000 to the Thomas M. Keinath Endowment for Environmental Engineering. This gift will provide unrestricted support for the department. Our sincere thanks to Steve and his wife, Kathy, for their generous support.

Hello from **Dan Matz** who is currently in Zermatt, Switzerland teaching geology. The program is called Swiss Semester (http://www.swisssemester.org/), which is a program for American high school sophomores.

The next issue will be published in February 2011. Please send your submissions for your activities during fall to Jan Young (ej@clemson.edu) latest by January 15, 2011. (Please do not forget to take pictures).

THANK YOU!