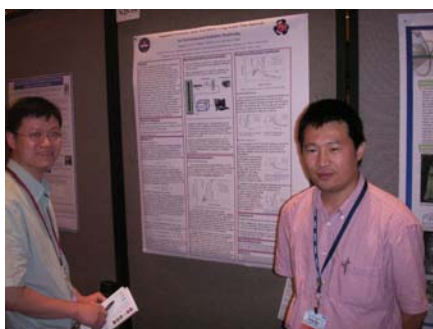


Ting Shao's paper entitled "Factors Influencing the Adsorption of Synthetic Organic Compounds by Carbon Nanotubes in Aquatic Environments" was selected as the winner of the 2009 Water Environment Federation Student Paper Competition in the Masters Division. As the winner, she received a \$500 award, present her paper at the Annual WEFTEC Meeting on Monday, October 12th in the Poster Symposium, and receive additional recognition at the WEF Annual Awards and Presidential Reception and Celebration on Tuesday October 13th. **Dr. Tanju Karanfil** serves as **Ting's** advisor.



Peng Luo received a Trainee Grant and was one of four students to receive the Valentin T. Jordanov Radiation Instrumentation Travel Grant so that he could attend and present his research at the 2009 IEEE Nuclear Science Symposium. The title of Peng's presentation was, "Sequential Probability Ratio Test Using Scaled Time-Intervals for Environmental Radiation Monitoring." **Dr. Tim DeVol** serves as **Peng's** advisor.

Phi Kappa Phi

This certifies that
Amer A. Kanan
is a member of The Honor Society of Phi Kappa Phi by
election of the Chapter at
Clemson University
and is hereby granted all the honors and privileges
pertaining to membership in the Society



October 15, 2009
Date

Alexander B. Rogers President
Debra A. Stroup Executive Director
Sean Williams Chapter President

Amer Kanan was elected into the
PHI KAPPA PHI Honors Society



Amy Hixon and **Dr. Brian Powell** went to Kennewick, WA to attend the 12th International Conference on the Chemistry and Migration Behavior of Actinides and Fission Products in the Geosphere. They gave the following presentations:

Hixon, A. R., Kaplan D. I., Kukkadapu, R., Odeta, Q., **Powell, B. A.**, "Examination of plutonium interactions with vadose zone sediments treated to enhance reduction capacity"

Powell, B.A., Dai, Z., Zavarin, M., Kersting, A. B. "Plutonium colloid formation and structural association with minerals"

Tinnacher, R. M., **Powell, B. A.**, Kersting, A. B., Zavarin, M., "Modeling the sorption and desorption kinetics of Np(V) and Pu(V) on goethite"

Zavarin, M., **Powell, B.A.**, Bourbin, M., Kersting, A. B. "Interaction of Plutonium with Montmorillonite: Surface Complexation and Ion Exchange"

The presentation "Plutonium colloid formation and structural association with minerals" won the best poster prize.

Dr. Tanju Karanfil's Research Group made several presentations at the 2009 Water Quality Technology Conference in Seattle, Nov 15-19, 2009:

Kanan, A. and **Karanfil, T.** "The Precursors of THM and HAA in Swimming Pools,"

Kaplan Bekaroglu and **Karanfil, T.** "Control of DBPs with GAC Adsorption for Compliance with the Stage 2 D/DBPR,"

Hu, J., Jones, D., Saglam, A., Song, H., Aurelien, T. and **Karanfil, T.** "Formation and Control of Emerging Halonitromethanes and Iodo-Trihalomethanes,"

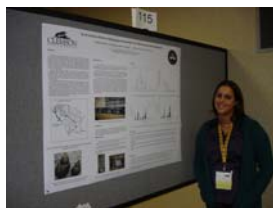
Jones, D., Saglam, A., Song, H., Aurelien, T. and **Karanfil, T.** "The Reduction and Enhancement of Iodo-trihalomethane (I-THM) Formation from Common Pre-oxidants used in Drinking Water Treatment,"

Zhang, S., Shao, T., Kaplan, S., and **Karanfil, T.** "Comparing Adsorption of Organic Contaminants by Carbon Nanotubes, Activated Carbon and Activated Carbon Fiber."

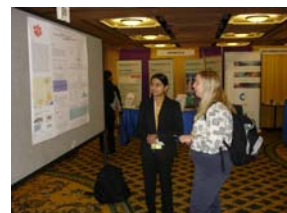
Dr. Shujuan Zhang presented the following paper at the 2009 AIChE National Meeting in Nashville, Tennessee in November, 2009.

Zhang, S., Shao, T., Kaplan, S., and **Karanfil, T.** "The Role of Aggregation in the Adsorption Behaviors of Carbon Nanotubes."

Tony Reid and **Dr. David Freedman** presented a poster at the SERDP and ESTCP Technical Symposium, Washington, DC (December 1-3, 2009). The title of the poster was "Observations of Ethene and Vinyl Chloride Bio-Oxidation under Anaerobic Conditions."



Meghan Dailey, Chemistry undergraduate, presented a poster titled "Is an Invasive Snail an Appropriate Biomonitor for PCB-Contaminated Sediment?" and Kusumica Mitra, formerly of Clemson University, presented a poster titled "Temporal Variation of Chiral PCBs in Two Fish Species" at the 30th Annual Society of Environmental Toxicology and Chemistry (SETAC) North American Meeting in New Orleans on November 19th. **Dr. Cindy Lee** served as their advisor.



Dan Matz mapping an agricultural field with electromagnetic induction

Dan Matz, a MS student working with **Dr. Stephen Moysey**, has returned home from India after spending five months living and working in Madhya Pradesh. While there he was conducting research on water resource management in collaboration with the Foundation for Ecological Security (FES). To accomplish this goal, **Dan** used geophysics, mainly electromagnetic induction, to look at soil variability in agricultural fields to try and help farmers with more water efficient irrigation practices. Furthermore, traditional hydrologic approaches were used to study the watershed, such as stream measurements, well measurements, and monitoring the weather in the watershed. Overall, the experience was fantastic for **Dan**, and hopefully a lot of the outcomes will help decrease the water stress faced by so many in this region each year. For more information about the field work that was conducted, go and visit **Dan's** online field blog that was updated often while he was in India: www.dansindiablog2009.blogspot.com



Dr. Moysey discusses the project with villagers.



Children standing in front of a poster board describing the impact of the project that was displayed in the village

Dave Hisz, Johnathan Ebenhack and **Dr. Larry Murdoch** conducted a collaborative field project with Tom Burbey, a professor at Virginia Tech, and his grad students. The project was conducted in August, 2009, and involved hydro-mechanical well testing at Dr. Burbey's hydrologic field research site near Virginia Tech. This project was the successful debut of our new downhole tiltmeter tool, which was developed as part of an ongoing NSF project. Results of the project will be the topic of two presentations at the fall AGU meeting in San Francisco.



Dave Hisz and **Johnathan Ebenhack** prepare to deploy specialized well testing tool during a field test in Virginia.

EEES graduate students, **Jose Alfaro** and **Jim Chamberlain**, attended the Engineers without Borders (EWB-USA) Southeast Regional Conference in Miami, November 13-15. They took with them 3 Clemson undergraduate engineering students who gave a project presentation on their work in El Salvador and led a one-hour session on water distribution design using EPANET, a design tool from the U.S. EPA. The students attended workshops on topics such as mentoring, health and safety, project management, and water chlorination system design. Jose and Jim continue to work with the EWB-USA Clemson chapter with current work focusing on a developing project in Liberia and continuing work in El Salvador.

Peng Luo and his wife, Xing, would like to share the great happiness of the birth of their first baby, David (Xu) Gao Luo. He was born on Sept. 30, 11:27 pm, 7 lbs 15 oz, 21 in. Both Mom and Baby are fine.



Nutra Manufacturing (with locations in Greenville, South Carolina and Anderson, South Carolina) donated a Perkin Elmer Optima 3100 RL Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES) to EEES in October 2009. **Ken Dunn** and **Anne Cummings** installed instrument in the main instrument lab (Rich Lab 114). This gift is a nice complement to the EEES analytical facilities and expands our metals analysis capabilities. Warm thanks to Nutra Manufacturing for thinking of us.



EEES Faculty, Staff and Students ran in a 5K marathon on Halloween in Greenville, South Carolina.

Top Row: **Dr. David Freedman, Jim Chamberlain, Thomas Mefford, Ben Sharp, Dan Matz, Francesco Barajas, Dr. Cindy Lee, Lee Stevens**

Second row: **Julie Mefford, Dr. Brian Powell, Kris Jurinko, Dr. Shelie Miller, Anne Cummings**

Halloween Pot Luck Party

FOOD, FUN and FREAKS were the agenda for the Halloween Lunch on Friday, Oct. 30th.

THE FUN & FREAKS



**H₂O
Mike Lilley**



**Olympic Gold Medal winner
Cindy Lee**



**GT Yellow Jacket
Anne Cummings**



**Spider Witch
Jan Young**



**Turkish Emperor
Meric Selbes**



**Pretty Witch
Ting Shao**



**ZORRO
Jose Alfaro**



**Cowboy
Brian Powell**

THE FOOD





It's the Holiday Season and although we all think of those less fortunate throughout the year, something in the Christmas spirit brings our thoughts to action. The Department is conducting a food drive for the Clemson Community Center again this year. The food drive includes faculty, staff and students in the department.



Once again the students did an outstanding job of hosting the December Holiday Party. The food was a delicious mix of the traditional turkey and dressing along with international dishes prepared by students from different areas around the world.



Entertainment was a sing-a-long with music provided by Spencer Hixon, Joel Kohn and Jim Chamberlain.



There was a hilarious game of Jeopardy with Students vs. Faculty and of course both sides claiming victory. And then there were the annual awards presented delightfully by our own Dr. Shelie Miller.



Every year we put up the Department Remembrance tree! With a collection of ornaments that date back to 1961, there's a lot of nostalgia in the decorating. The staff provide cookies and all students and faculty are invited to participate. It's a lovely way of remembering past students and involving our current students in a long-time tradition.



Dr. David Freedman was approved as a Board Certified Environmental Engineers (BCEE) by the American Academy of Environmental Engineers (AAEE).

Dr. David Freedman was awarded a patent on November 10, 2009, number 7,615, 153 B1, entitled "Microbial Based Chloroethene Destruction." The co-inventors are Christopher E. Bagwell (Savannah River National Laboratory), Robin L. Brigmon (SRNL), **William Bratt** (formerly MS student in EES, now at CH2MHILL in Atlanta), and **Elizabeth Wood** (formerly MS student in EES). The abstract states: "A mixed culture of Dehalococcoides species is provided that has an ability to catalyze the complete dechlorination of polychlorinated ethenes such as PCE, TCE, cDCE, 1,1-DCE and vinyl chloride as well as halogenated ethenes such as 1,2-DCA and EDB. The mixed culture demonstrates the ability to achieve dechlorination even in the presence of high source concentrations of chlorinated ethenes."

The Department of Defense (DoD) announced that the proposal entitled "Subsurface Thermal Energy Storage for Improved Heating and Air Conditioning Efficiency" submitted by **Dr. Ron Falta** (PI), **Dr. Fred Molz** along with Chuck Newell (GSI Environmental, Inc.; Houston, TX) was selected for funding. This four year project funded at \$971K will build a new generation of a geothermal heat pump system that is assisted by subsurface thermal energy storage. The project team will build this system to heat and cool a 10,000 to 20,000 ft² building at a DoD facility somewhere in the US (location to be determined).

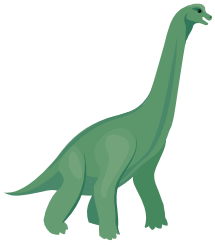
Drs. Ron Falta and Larry Murdoch obtained a grant funded by the DoD through the ESTCP program. The project, titled "Incorporating Aerobic Processes into Remedies for Large Chlorinated Solvent Plumes" is for a total of \$946,000 over two years. It is a collaborative effort between the Savannah River National Laboratory (Brian Looney, Principal Investigator), the Idaho National Laboratory (Hope Lee, co-Investigator), and Clemson (Dr. Ron Falta, Investigator). Clemson's part of this project amounts to \$163,615, and the project will be administered through the SRNL as a subcontract.

Some fish caught in South Carolina may not be safe to eat because they contain harmful levels of chemicals that cause health problems, especially for children and pregnant women.



Environmental chemist **Dr. Beth Carraway** studies how mercury moves through stream and river environments. Organic sediment, such as leaves and grasses, can remove some of the chemical from water. However, certain bacteria can transform mercury into methyl mercury that builds up in insects and fish, magnifying the health risks.

"We need to identify and explain how mercury gets into the water and where it poses the greatest concern," said Carraway. "With this information we can make better choices about applying technologies and setting reductions, along with making better predictions about exposure levels to people." Burning coal, other fossil fuels, and even trash – as well as factory smokestacks – can increase the mercury in the air. The chemical returns to the earth in rain and snow and ends up in lakes and rivers. The U.S. Geological Survey reports that the Southeast in general and the Santee area in particular show above average methyl mercury levels.



Today, just about anywhere there is water, there can be toxic algae. The microscopic plants usually exist in small concentrations, but a sudden warming in the water or an injection of dust or sediment from land can trigger a bloom that kills thousands of fish, poisons shellfish, or even humans.

Dr. James Castle and John Rodgers of Clemson University think the same thing happened during the five largest mass extinctions in Earth's history. Each time a large die off occurred, they found a spike in the number of fossil algae mats called stromatolites strewn around the planet. Castle will be presenting the research on October 19 at the annual meeting of the Geological Society of America in Portland, Oregon.

Research by **Dr. Jim Castle** and Dr. John Rodgers was reported worldwide after they proposed a new hypothesis for mass extinctions at the national Geological Society of America meeting in October. Their research, which included examining occurrences of modern algal toxins and the distribution of algal structures through geologic time, suggests that toxin-producing algae may have played an important role in the major mass extinction events during the past one-half billion years. The research findings by Castle and Rodgers were reported in newspapers around the world and announced by numerous organizations including National Geographic Society, NASA, MSNBC, Science Daily, UPI, U.S. News and World Report, the Society of Environmental Journalists, Europa Press, and Yahoo. Castle and Rodgers were interviewed on national public radio shows, but they say that the most fun they have had through this publicity is reading the blogs on their hypothesis. Contact **Jim Castle** (jcastle@clemson.edu) or John Rodgers (jrodger@clemson.edu) if you would like a copy of their paper.

Dr. Glen Daigger, former EEES department chair, was elected President of the International Water Association (IWA). **Dr. Daigger** will assume his term as President of the Association in September of 2010 and will be inducted at the Montreal Congress.

Dr. Cindy Lee recently met up with **Dr. Kevin Farley**, a former EEES faculty member who is now at Manhattan College.



***The next issue will be published in May, 2010.
Please send your submissions for your activities during Spring to
Jan Young (ej@clemson.edu) by April 23, 2010.
(Please do not forget to take pictures).***

THANK YOU!