

EEES NEWS

Student News

Spring, 2013

Amy Meldrum (EE&S, MS) was awarded the Roscoe Hall Scholarship from the Savannah River Chapter of the Health Physics Society. Besides the honor of being selected as the 2013 Clemson University recipient of this award, Amy received a check for \$3,500.



The National Science Foundation offers 3-year graduate research fellowships (NSF GRF) to students in science, engineering, mathematics, technology, and some social sciences.

Louis Hill, Biosystems Engineering graduate student was named Honorable Mention in this year's competition.

EEES Student Awards for 2013

Onur Apul-L.G.Rich Water Environment Association Award
Hillary Emerson-Dr. William R.Heatley, Jr. Award
Peng Xie-Ray Abernathy Water Environmental Award
Alex Beebe-Environmental Scholars Award
Tim Sattler-Environmental Scholars Award
Andrea Creighton-Jean G. Stillwell Award
Alex Balwin-Thomas F.Logan, Jr.Geology Merit Award
Louis Hill-Environmental Scholars Award
Heather Sprague George B. Nutt Award
Tyler Barzee-George B. Nutt Award
Jaclyn Lauer-Thomas M. Keinath Environmental Engineering Award
Katie vanValkinburg-Thomas M. Keinath Environmental Engineering Award



April Gillens attended the 245th American Chemical Society National Meeting & Exposition April 7-11, 2013 in New Orleans, Louisiana to give a presentation entitled, "Carbon Isotope Signatures of Tributyl Phosphate Related to Nuclear Solutions to Nuclear Forensics Problems" session. The meeting was hosted by the Division of Nuclear Chemistry and Technology.

Clemson's Geology Club has been busy this spring. The club continues to provide tutoring and study sessions for Geol 101 students. The club organized two trips; a 1-day hiking trip in DuPont State Forest and an overnight camping trip at Riley Moore Falls. Two guest speakers came to club events to inform students about AmeriCorps projects in West Virginia watersheds and sustainability efforts in Greenville. The club also set up a booth at the annual Hydro Symposium. They have also elected officers for 2013-2014!

President-**Andrea Creighton**
Vice President-**Katie Hickok**

Secretary-**Savannah Miller**
Treasurer-**Dana Walters**

The officers are already discussing some big plans for next year, so everyone should get excited about participating next year.

Student Awards & Internships:

Several Geology majors have received internship offers and/or acceptance into field programs for this summer. To date these include the following:

Kim Gloerson (University of Southern California) **Brian Bastian** (Environmental Conservation Organization of Western North Carolina) **William Chamlee** (GeoCorps) **Andrea Creighton** (SAGE field program) **Katie Hickok** (University of Oregon field camp)



Rachel Thomas was co-chair of Clemson's Earth Day committee. This year's earth day festival featured local vendors, Clemson's sustainability-oriented clubs and Creative Inquiries, and other informational booths. There were performances by local musicians as well as professors from Clemson. The festival focused on providing students and community members with opportunities to get involved in environmentally sustainable practices around campus.



Biosystems Engineering students **Carolyn Coffey, Melissa DeSantiago & Kelly Cresswell** with their Ecological Designs and display.

The **Biosystems Engineering Club** recently took a trip to Oklahoma State University to attend the annual South East Region Rally of the American Society of Agricultural and Biological Engineers (ASABE). Five undergraduate Biosystems Engineering students attended the meeting: **Tyler Barzee, Melissa DeSantiago, Taylor Wade, Kyle Mihaljevic, and Zach Wainwright**. Clemson presented the progress of the ASABE chapter that is integrated into the BE Club here and showed off our volunteer projects and student learning initiatives like: Adopt-A-Highway Cleanup, industry speakers, brewery tours, and fundraising activities.

This rally is an opportunity for students from universities in the region to meet, share ideas to grow each chapter, and network with professionals in the biological and agricultural engineering disciplines. The group had the opportunity to tour the hydraulics lab, the stream restoration, alternative energy and constructed wetlands projects in the botanical gardens at Oklahoma State University. Speakers from different industries then came to speak to the groups and ranged from engineers at Ditch Witch, food companies like Bama, the Natural Resources Conservation Service, and Halliburton. The topics of discussion ranged from the day-to-day activities of an engineer to the importance of soft skills in the workplace. The students also participated in a design competition to elevate a full can above a sidewalk using only planks of wood and no nails which encouraged collaboration between students from different universities and was just plain fun.

It was a long trip to Stillwater but we all learned a lot from this experience and hope to attend next years rally in Auburn!



From left to right: **Zach Wainwright, Kyle Mihaljevic, Taylor Wade, Melissa DeSantiago, and Tyler Barzee**



Touring OSU's Hydraulics Lab. Picture is of a stepped-spillway from a dammed lake



Listening to industry speakers

Design Competition



Environmental Engineering and Science students and faculty made a strong showing at the South Carolina Environmental Conference (SCEC) in Myrtle Beach on March 10-13, 2013. Activities included a poster competition, oral presentations, and an Environmental Jeopardy quiz game.

Poster competition winners were:

1st place in the water category: **Gamse Ersan**

Gamse receives funds to attend and present at the Annual Conference and Exhibition (ACE), the American Water Works Association's main yearly event.

1st place in the wastewater category: **Peng Xie**

Peng receives funds to attend and present at the Water Environment Federation's main event, WEFTEC.

2nd place: **Mahmut Ersan** and **Wilson Beita**

3rd place: **Onur Apul**

Oral presentations were given by **Peng Xie, Dr. Tanju Karanfil, Dr. David Ladner, Mahmut Ersan, Wilson Beita** and **Chip Wyatt**.

Peng presented, "Sinusoidal spacers for mitigating concentration polarization in reverse osmosis."

Dr. Karanfil presented a talk originally planned by his student **Habibulla Uzun**, "Seasonal Variation of NDMA Formation Potentials in Source Waters and Control of NDMA at Drinking Water Treatment Plants."

Mahmut and **Wilson** presented, "Removal of THM and NDMA Precursors Using Powdered Activated Carbon."

Dr. Ladner presented, "Deploying QR Codes for Educating Water Consumers about the Water-Energy Nexus through their Mobile Devices."

Chip Wyatt presented "Design of Pilot Sediment Control Facility – a BE senior design project."



Poster presenters at SCEC. Left to right: Mengfei Li, Meric Selbes, Ying Tu, Bin Zhang, Peng Xie, Chen Chen, Mahmut Ersan, Yang Zhou, Gamse Ersan, Onur Opul, Wilson Beita, Muriel Steele, and Erin Partlan.



Kevin McIntyre, Robbie Getsinger, and Peng Xie holding the travelling trophy after their Environmental Jeopardy win at SCEC.

The Environmental Jeopardy quiz game is an extracurricular event held annually at SCEC. The water industry teams were stunned when Clemson students **Kevin McIntyre, Robbie Getsinger, and Peng Xie** pulled off the upset win.

Environmental Engineering Capstone Design Inaugural Year

The undergraduate Environmental Engineering degree held its first year of Capstone Design this spring. Students gave their final presentations on April 25th and the event was well received by the industry representatives who came to evaluate the program. Four teams worked on two projects. One project was an upgrade to the City of Clemson's Cochran Road wastewater treatment plant. The other project was the design of an industrial wastewater pretreatment process train for removing dissolved solids. The instructor was **Dr. David Ladner, Dr. Tom Overcamp** and **Dr. David Freedman** also participated.



Environmental Engineering Capstone Design Students. Left to right: **Kevin McIntyre, Justin O'Brien, Kathryn Fauerby, Erin Grubbs, Jaclyn Lauer, Preston Busbee, Nick Webber, Ryan Cox, Robbie Getsinger, Jessica Bush, Joe Batts, Malcolm Glenn, Walt Barnett, Zachary Priestler, Amanda Kunkle, Stephanie Carey, Adam Grant, and Zachary Trammel.**

Employment Panel hosted by the Clemson Student Chapter of the American Water Works Association (AWWA)

On February 13th the Clemson Student Chapter of the American Water Works Association (AWWA) held their second annual Employment Panel. Four panelists shared their insights about finding and enjoying employment in the water and wastewater industry. Two panelists represented the engineering consulting realm, Flint Holbrook (Senior Vice President with Woolpert and Keith McLeod), (South Carolina Office Manager with URS). One panelist was from the municipal side, Doris Wilson (Director of Public Utilities, Town of Pendleton). The fourth panelist represented an equipment/chemical vendor, Julie Hellman (South Carolina Sales Manager with Hach).



Other industry guests attended to network with students. They were John Cook (Advanced Data Mining International), Chris Erickson (CH2M Hill), Steven Gagnon (AVANTech), Bob Horner (Weston & Sampson), Jay Mazzei (Brown and Caldwell), Angie Mettlen (WK Dickson), Robert Osborne (Black & Veatch), Dyke Spencer (Powdersville Water District), and Ed Winn (Bend Services).

A range of topics were covered during the panel discussion, including how to make the most of your college years to gain valuable experience qualifying you for employment, the oral and written communication skills needed in the industry, and the importance of maintaining good relationships in this close-knit community.

After the panel discussion, refreshments were enjoyed while students and industry guests networked. Feedback was resoundingly positive and we look forward to continuing this tradition next year.

ACC Clean Energy Challenge



Clemson University's team, Brewcovery, competed earlier this week in the ACC Clean Energy Challenge in Raleigh, NC, coming in second place and taking home a \$5,000 prize. The team is composed of **David Thornton, Alex Pellett, Holly Garrett** and **Dr. Terry Walker** in Biosystems Engineering. They were judged at the University level before advancing to the semi-finals on April 8th and 9th, where ten teams from the Southeast came to compete. They were joined in the Final Four by home team NC State, Duke and NC A&T who swept first prize and \$100,000 to start a business that turns swine waste into a bio-based adhesive. Clemson's team, Brewcovery, recovers food and brewery wastes and converts these waste streams into valuable co-products:

feed, biofuels and soil amendments utilizing the black soldier fly, *Hermetia illucens*. The team works closely with the Student Organic Farm at the Calhoun Field Station as well as Clemson Dining Services to collect food wastes. President Barker has signed the President's Climate Commitment and is dedicated to bringing Clemson's carbon footprint to nil by 2030. With the goal of diverting 100% of Clemson's food wastes into these value-added products, Clemson will reduce their carbon footprint by eliminating transportation of these wastes to the landfill, where they would change into yet another greenhouse gas, methane. Rather, Brewcovery helps create value in the form of marketable co-products that will be used as inputs for growing grains and energy crops. In addition, the Brewcovery truck fleet will run on clean-burning biodiesel to further reduce carbon pollution. Cradle to cradle thinking is one piece of the sustainability puzzle and businesses are beginning to value the triple bottomline, taking the entire supply chain into consideration from raw material to disposal. Congrats to the Clemson team, Brewcovery!





Dr. Brian A. Powell has been selected to receive the DOE 2013 Early Career Research Program award. This is a five-year award for \$750,000 for his proposal titled "Examination of Actinide Chemistry at Solid-Water Interfaces to Support Advanced Actinide Separations".

For more information, please visit <http://science.energy.gov/early-career/>

Congratulations, Brian!



This spring semester, the Environmental Engineering professional advisory boards met on Campus in Brackett Hall. Each meeting was a productive time of members meeting with faculty, students and staff. These meetings are very important to the accreditation process for the undergraduate engineering majors. In addition, the departmental Environmental Engineering and Earth Sciences

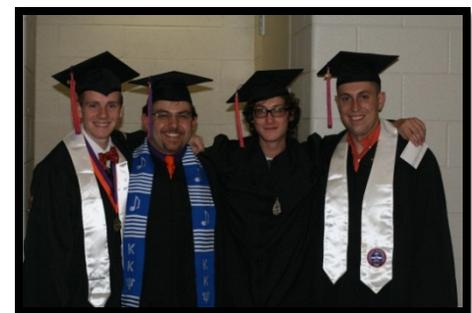
Biosystems Engineering and



Advisory Board met for the first time to discuss the state of the department many other important topics. Thanks to all of our board members, many of whom traveled significant distances to participate in these meetings.



Environmental Engineering and Earth Sciences had 31 undergraduate students graduate on May 10th; fifteen (15) in Biosystems Engineering, twelve (12) in Environmental, and five (5) in Geology. Many of the students and their families attended a reception hosted by the Department prior to the evening graduation. Everyone had a great time as students introduced their families to their professors. The faculty presented the graduates to the attendees, and everyone enjoyed delicious snacks!



The 21st Annual Clemson/David S. Snipes Hydrogeology Symposium was held on April 4th at the Madren Center along with field trips on April 3rd, 5th, and 29th. This year's event attracted over 375 attendees – an all-time record! The keynote speech was given by **Dr. Fred Molz**. Fred's talk was "Computer Modeling in Hydrogeology: Where Did It Come From, How Has It Evolved, and Where Is It Going?"

Most attendees were from South Carolina, but there were others from North Carolina, Georgia, Tennessee, Virginia, and Florida. Over fifty oral and poster presentations were given with three consecutive oral presentation sessions. The theme sessions covered these topics: Hydromechanics, Constructed Wetland Treatment Systems, Emerging Contaminants, Groundwater Characterization, Chemical Remediation, Geophysics, Biodegradation, Remediation techniques, and the Clemson Creative Inquiry (CI) undergraduate senior projects. Ron Falta gave a talk on "Migration of Exsolved CO₂ Following Depressurization of Saturated Brine". Stephen Moysey directed a workshop called "3D imaging of the Subsurface with Multi-channel Ground Penetrating Radar: From Promise to Practice". Graduate students giving oral presentations were **Johnathon Ebenhack, Dave Hisz, Catherine Ruprecht, Alex Beebe, Adam Mangel, Erasmus Oware, Jeff Schwindaman, Ruthanne Coffey, Amy Hixon, Alex Hanna, Hilary Emerson, Shanna Estes, and Na Hao**. Geology undergraduates who presented the results of their senior CI research project included **Jonathan Baldwin, Tyler Waterhouse, William Chamlee, MollyJane Lyles, Peter Wylie, Erin Black, and Alex Lefitz**. A complete list of presenters and the titles of their talks can be found at:

<http://www.ces.clemson.edu/hydro/symposium/speaksched.htm>

In addition to the posters, 30 exhibitors from around the US displayed their products and services. After the symposium, a mixer was held at the Geology Museum.

The field trips were led by **Scott Brame**, Jack Garihan of Furman University, and Bill Clendenin, State Geologist for the state of South Carolina. The field trips examined the structural nature of the Brevard Fault Zone as it is currently being exposed at record low water levels on the shores of Lake Jocassee. Over 150 people attended the three field trips.



Vendors and attendees at the Madren Center on April 4th.

Bill Clendenin, State Geologist of SC, standing onshore and explaining the nature of the South Boundary fault that comprises the eastern edge of the Brevard Fault Zone on Lake Jocassee on April 5th.



SWITCH Screening held at Clemson University in March

Environmental Engineering and Earth Science joined more than a dozen college campuses in North Carolina and South Carolina in a free screening of SWITCH in observance of National Engineers Week, providing a wide-ranging, objective and pragmatic look at the complete spectrum of energy generation, including nuclear, fossil-fueled and renewable resources. The Carolinas have been building a national and multi-national energy reputation for the past several years, emerging as a center of nuclear energy knowledge and

expertise, innovative smart grid industrial clusters, biomass expertise, craft-level workforce training and university energy research.

The documentary explores the world's leading energy sites, including some that are highly restricted and never before seen on film. Geologist Scott Tinker aims to provide straight answers from the people driving energy today -- international leaders of government, industry and academia -- and to cut through the confusion to create a common understanding of what the energy future holds.



Students, faculty, staff and the public enjoyed the film and participated in a follow-up panel discussion moderated by **Dr. Lindsay Shuller-Nickles**. Panelists included **Dr. Terry Walker** (biofuels), **Dr. Annick Anctil** (solar), **Dr. Ron Falta** (C-sequestration and low carbon alternatives), **Dr. Tim DeVol** (nuclear), and special guest Roger Schonewald from GE Power and Water.

Our thoughts and prayers are with the family of **Richard Hegg, retiree**. Richard Hegg of Arlington, Virginia, died April 1, 2013. He served as department head of Agricultural Engineering and retired in 1997 after 30 years of service. Hegg is survived by his wife and two children. Hegg was laid to rest near his hometown of Bruce, South Dakota. Condolences can be sent to the Hegg Family at 1101 S. Arlington Ridge Rd., #1210, Arlington, VA 22202.

The next issue will be published in September 2013. Please send your submissions for your activities during the summer semester to Jan Young (ej@clemson.edu) by August 15, 2013. (Please do not forget to take pictures)!

THANK YOU!