

FALL 2011

THE COLLEGE OF arts & sciences

earth & environmental sciences

2011 DEPARTMENT NEWSLETTER



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<http://ees.as.uky.edu>

Letter from the Department Chair



What a fantastic year this has been for the department! UK Geology alumnus Tom Spalding (VP for technology, Pioneer Natural Resources), called me in May saying that Pioneer was planning to give the department a large gift to make a strategic faculty hire and

promote graduate and undergraduate education and research. Dean Kornbluh of the college partnered in this offer and has opened the new faculty search for the Pioneer Professor in Stratigraphy. This search is now underway and we hope to hire a faculty member in this position to start in August of 2012. In October, during the homecoming week, we hosted a gift appreciation ceremony in which Dean Kornbluh and, the new president of the university, Dr. Eli Capilouto spoke and received the check from attending Pioneer alumni. We also awarded our first Pioneer undergraduate scholarship to an incoming student, Ellen Kaiser. The Pioneer award allows us to be on firmer footing, it means a lot to us, and we all greatly appreciate it. You can read more about this gift at: <http://www.as.uky.edu/ees-breaks-ground-pioneer-gift>

We have also made a number of great faculty and lecturer hires during the last year. We have hired two faculty members in the disciplines of hydrogeology and geomechanics and both of them will start at UK from January of 2013; I will talk about them more next year. We have also managed to hire two extremely capable lecturers in Dr. Rebecca Freeman and Dr. Marta Clepper. Dr. Freeman has teaching experience at Tulane and is just the sort of person we were looking for to undertake many of our active learning undergraduate courses. Marta Clepper is a UK Ph.D. and has extensive prior teaching experience at UK. We welcome both Dr. Freeman and Dr. Clepper to the department.

We also had two new faculty members join the department this fall. Dr. Kevin Yeager is a coastal sedimentologist with an excellent funding record. Dr. Yeager is an associate professor and came here from University of Southern Mississippi. He has already established a new high-tech radionuclides laboratory facility in Slone and hired a number of undergraduate and graduate students into his research program. Having undergraduates working in our laboratories is crucial for academic engagement of our un-

dergraduate students so that they can continue studies towards graduate degrees and become engaged professionals.

Dr. Sean Bemis, our second faculty hire from last year also started this fall. He came here from a two year Mendenhall post-doctoral fellowship at the U. S. Geological Survey. His specialty is in neotectonics and is already contributing to the department through teaching a new graduate course and also the graduate seminar. He has outstanding growth potential and we wish him success!

The Pioneer funding and the recent successful Brown-McFarlan fund-raising campaign is making it possible to maintain research and conference funding to our increasing numbers of graduate students. We also want more of our undergraduate students engaged in research. Education research and our experience shows the more the students are actively engaged in research the better their academic engagement and performance. We need to create more research funding and scholarships for involving more undergraduate students in research. We hope you will help us in that endeavor.

It is always nice meeting and learning about the alumni and friends of the department. So drop us a line about what you are up to or drop in when you are passing through or visiting family. Happy holidays and best wishes for 2012!

Sincerely - **Tiku Ravat, Chair**,
Dept. of Earth & Environmental Sciences

And a short note from the Newsletter Editor...

Welcome to the 2011 EES/Geology Newsletter. More info and the latest Department news are listed on the Department web page, which can now be found at:

<http://ees.as.uky.edu>

The College of Arts & Sciences has assumed the chore of designing and maintaining web pages for Departments within the College. However, Professor Chris Romanek and Dr. Suvankar Chakraborty continue the role of providing content and updating many aspects of the webpage. As always, we encourage alumni to suggest or provide material that could be included on the website!

Thanks to all of you and best wishes for 2012!
Dave Moecher, Associate Professor

Transitions... Kieran O'Hara Retirement

Dr. Kieran D. O'Hara, Associate Professor, retired in Fall 2011. Kieran received the B.Sc. from University College Dublin, and the M.S. and Ph.D. from Brown University. He joined the faculty in 1986. Kieran had a very creative mind and his research on the geochemistry of fault rocks remains widely cited. He is currently working on a textbook on earth resources, and plans a second book geared toward the public on aspects of popular science. We wish Kieran all the best in the coming years.

...and Recognitions! Tiku Ravat is Purdue University EAS Outstanding Alumnus

Professor Dhananjay (Tiku) Ravat, Chair of the Department of Earth and Environmental Sciences at UK, was recently presented with the Outstanding Alumnus Award for 2011 by the Purdue University Department of Earth and Atmospheric Sciences. Tiku earned his M.S. in 1985 and Ph.D. in 1990 in potential fields geophysics (magnetics and gravity). In addition to being recognized for being Chair of OUR department, Tiku was recognized for his role in compiling and publishing the Magnetic Anomaly Map of the World for the Commission for the Geological Map of the World.

See: <http://ees.as.uky.edu/tiku-ravat-honored-purdue-university>



Pamela Stephens Graduates!

Our able Dept. Business Officer, Pamela K. Stephens, graduated from UK in December with a B.S. degree in Family Science. Pam has been working hard on her classes while working full time in EES *and* serving in the Kentucky Army National Guard. We extend our sincere congratulations to Pam!

Recent EES Ph.D. Student Receives International Award

Dr. Matt Massey, a 2010 Ph.D. product of our Department, received the Student Paper of the Year Award from the Journal of Structural Geology for a paper based on his dissertation research.

See <http://ees.as.uky.edu/climbing-his-way-top>

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Stay connected...

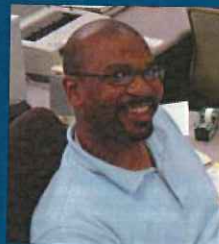
You can keep track of Department events, the Rast-Holbrook seminar schedule, our contact information, and alumni events via the Department web page:

www.as.uky.edu/ees

...and keep in touch!

Please let us know if your address or contact information change. Send a note to, email, or call George White, the department Administrative Assistant:

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Mr. George White, EES Staff Assistant

COVER PHOTO: The 2011 UK Geology field camp students take a break after measuring the lower Paleozoic section at Cement Creek: Frank Etensohn seated at front.

Department News: Degrees and Awards

2011 Degrees

Undergraduate Degrees

Bachelor of Arts

Cate Burton
Jeff Castro
Jared Leedy

Bachelor of Science

Jill Riddell
Trevor Strosnider
Phil Wolfe

Graduate Degrees

Master of Science

Ashley Barton: "Fate of stable isotope label during predation of 15N-tagged wild-type *Escherichia coli* by protozoa"

David Butler: "Scenario hazard assessment of Tianshui's urban area, Gansu Province, People's Rep. of China"

Tricia Coakley "Locating hot spots of human fecal pollution in an urban watershed of central Kentucky using *Bacteroides* 16S rRNA markers"

Emily Eastridge "Arsenic heterogeneity in aquifer sediments from West Bengal, India"

Shoba Gowda "One-dimensional ground-motion modeling at the Central United States Seismic Observatory"

Daniel Hunter "Defining the geologic site model for the Central United States Seismic Observatory"

Bethany Overfield "A classification of Lower Paleozoic carbonate-bearing rocks for geotechnical applications"

Anthony Paschall "Ground-motion site effects in the Wabash Valley region from the 18 April 2008 Mount Carmel earthquake and aftershocks"

Thomas B. Walker "Bedrock geology and tectonic evolution of the western Central Maine Zone, southcentral Massachusetts"

Doctor of Philosophy

Eric Anderson "Petrologic, geochemical, and geochronologic constraints on the tectonic evolution of the southern Appalachian orogen, Blue Ridge Province of western North Carolina"

Marta Clepper "Lithostratigraphic and paleoenvironmental framework of the Upper Ordovician Lexington Limestone, Bluegrass Region, central Kentucky"

Estifanos Haile "Chemical evolution and residence time of groundwater in the Wilcox aquifer of the northern Gulf Coastal Plain"

John Hickman "Structural evolution of an intracratonic rift system; Mississippi Valley Graben, Rough Creek Graben, and Rome Trough of Kentucky, USA"

Devi Ugdata "Depositional and stratigraphic significance of marine, green-clay, mineral facies in the Lower-Middle Mississippian Borden and Fort Payne formations, western Appalachian and eastern Illinois Basins, KY"

2011 Student Awards

Undergraduate Awards

Pirtle Outstanding Senior Scholarship
Chris Manning

Glenn Rice Memorial Tuition Scholarship
Jared Leedy

Sigma Gamma Epsilon Tarr Award
Cate Burton

Graduate Awards

Pirtle Fellowships

Ashley Barton
Cory Black Eagle
Susan Leib
Ryan Quinn
Catherine Skees

Pirtle Scholarships

Melissa Bishop
Nicholas Levitt
Gabriel RiCharde
Mahnaz Sepehrmanesh
Ganesh Tripathi
Thomas Walker
Forrest Webb
Olivia Woodruff

Brown-McFarlan Fund Travel Awards

Ali Al-Mayahi
Ralph Bandy
Ashley Barton
Susan Leib
Ryan Quinn
Gabriel RiCharde
Ganesh Tripathi
Thomas Walker

J.C. Ferm Fund Research Awards

Melisa Bishop
Melissa Ditty
Susan Leib
Nick Levitt
Ryan Quinn
Gabriel RiCharde
Catherine Skees

UK Graduate School Fellowship for Selected Areas
Melissa Ditty

Lyman T. Johnson Award
Carrington Wright

Cralle Foundation Joan Cralle Day Fellowship
Michelle Johnston

Outstanding T.A. Awards
Ashley Barton
Ralph Bandy

Featured EES News: New Faculty

Prof. Sean Bemis

I grew up in Washington State then headed to Alaska for college, where after 4 years and completion of a B.S. in Geology, I decided to stay at the University of Alaska-Fairbanks for grad school. I completed the M.S. in 2004, and then headed into the field with a USGS crew for 2 weeks working on paleoseismic study of the Denali fault. Just a few weeks later I landed in Eugene, OR, where I spent the next 5.5 years at the University of Oregon working on a Ph.D. with Dr. Ray Weldon. I developed a new project in Alaska, relating to the structure and Quaternary tectonic activity of thrust faults (many previously unknown) in the Alaska Range, and attempting to understand the relationship between these faults, the right-lateral Denali fault, and the Quaternary uplift of the Alaska Range. I followed my Ph.D. with a 1.5 year stint as a Mendenhall Postdoctoral Fellow with the U.S. Geological Survey in Menlo Park, CA. My work focused on the Pacific Northwest and utilized newly-acquired airborne LiDAR data for NW Oregon and SW Washington to assess the potential for Quaternary tectonic activity associated with bedrock fault zones.

After spending my entire life up to this point in all four states on the US west coast (plus numerous family vacations to British Columbia), I took the big leap (with my wife Shannon) east to begin my career here at the University of Kentucky. I am continuing research into active faults and related deformation in the Pacific Northwest, although my main research focus for the next several years will be in Alaska. With major infrastructure projects in the proposal and planning stages, there is an extreme need for advancing our understanding of active faults and seismic hazards throughout the state. In addition, the National Science Foundation has two major research initiatives (Earthscope and GeoPRISMS) that will move into Alaska soon and facilitate an active research program. I also look forward to getting up to speed on the seismic hazards facing Kentucky and the central US and learning how I can contribute to this challenging active tectonic setting.

In Fall 2011 I taught a new course on the geology of earthquakes. In Spring 2012 I'll take on the undergraduate structural geology course, which I will be teaching every year, and I look forward to incorporating modern digital and computational tools in addition to the fundamental techniques of structural geology. In the coming years, I anticipate strengthening our department's geomorphology curriculum, developing advanced structural geology courses, incorporating GIS and surveying techniques into our courses, and contributing to departmental offerings in natural disasters, introductory geology, and environmental geology.

My wife Shannon and I are expecting our first child soon. We're excited but bracing ourselves for the lifestyle changes. Otherwise, I enjoy gardening, supporting local and organic food production, and look forward to getting more involved with my new community as an active member of Kentuckians For The Commonwealth.



Prof. Kevin Yeager

Greetings! I am another of the new guys around here having arrived in Lexington in July. My first few months at UK have been great, and my wife Julia (faculty in UK's Department of English) and I have really been enjoying the process of getting to know Lexington. I am originally from Erie, Pennsylvania and like many of my colleagues, have taken a circuitous path to Lexington. I have lived in Ohio, Texas, Louisiana, Mississippi, and now Kentucky. I am a sedimentary geologist interested primarily in the interactions between humans and Earth's surface. So, much of my work is done in modern or geologically "young" (less than say 2 million years old) sedimentary systems.

My first term has been very busy with work to get our research off the ground at UK, including finishing laboratory and research space renovations, bringing instruments online, and getting our new group of outstanding graduate (3) and undergraduate (1) students involved in our various projects. I have been active in teaching and service as well, having taught "Endangered Planet: Introduction to Environmental Geology" in the fall along with service on departmental committees and professional service (journal and proposal reviews, etc.). Over the coming year, we plan to grow and further diversify our research group through the addition of undergraduate students and visiting scientists in particular, and the expansion of our analytical capabilities into new areas.

Our current research agenda is diverse and exciting! While we have already begun to think about ways to engage with colleagues at UK and throughout the region to address research questions close to home, we continue work that we began while in southern Mississippi. Some of our active projects include (1) Research to understand the ecological impacts and fate of mercury (Hg) derived from large-scale industrial releases in the Penobscot River and Estuary in coastal Maine; (2) Collaborative research with the U.S. Department of Defense focused on understanding how low oxygen conditions (hypoxia) in bottom waters of the continental shelf in the Gulf of Mexico can alter the geotechnical nature and ecological composition of bottom sediments; (3) Research looking at how coastal growth faults in the northern Gulf of Mexico can fundamentally influence things like the rate of relative sea level rise, the rate of marsh vertical accretion, the supply and quality of freshwater and the sustainability of vegetation communities in these environments; and (4) Research focused on the possible impacts of the Deepwater Horizon oil spill on a wide range of sedimentary environments and coupled bottom (benthic) ecosystems in the Gulf of Mexico, from the coastal marsh margin to the deep sea (2,700+ meters).

Finally, should you or your family be visiting our department this coming year, please stop by the Sedimentary, Environmental and Radiochemical Research Laboratory (SER₂L) on the first floor of the Slone Research Building and say hello; we will give you the grand tour and would be happy to show you what we are up to!



Featured EES News: New Lecturers and Lab Support Staff

Dr. Marta Clepper

Originally from Georgia, I spent the first part of my life training and competing horses and running my parent's farm. After they sold the farm, I embarked on my second career by going back to school, where I discovered my love for geology. I completed my B.S. in geology at Columbus State University (GA) in 2000 and my M.S. at the University of Texas at El Paso in 2002. While at UTEP I completed a study using carbonate soils to determine paleoclimate in the Trans-Pecos region of western Texas. Wanting to come back closer to home, I attended the University of Kentucky for my Ph.D., which I just completed this past summer. While at UK I have done extensive research on the Lexington Limestone Formation, learning a great deal about carbonate depositional environments. There are still many parts of the Lexington that I want to work on, so I will mostly be continuing my research on that for the near future.



While at UK, I have had the opportunity to teach various courses, which led me to my decision to pursue teaching as a career. I have found that I enjoy interacting with the students in the introductory-level courses. While they may never become geology majors, I find it rewarding when they start to realize how everything that they do impacts the world at large. During this past semester, which was my first as a full-time lecturer, I worked not only with these same groups of students, but also taught my first field methods class. This experience has been both challenging and rewarding at the same time. While I found that teaching someone how to do field work is a greater challenge than doing it yourself, the rewards of seeing the students' progress and grasp the bigger picture made it worthwhile.

Having been here in the department for the past nine years, this is a place where I feel at home, and I was very happy to be able to begin my professional teaching career at a place that I am familiar with. I look forward to teaching here at UK for many years to come.

Dr. Rebecca Freeman

I am the newest addition to the department. I interviewed in late May the day before a month of field work in Utah, was hired in June, and moved to Lexington in July. It was a busy summer! Although I have spent a great deal of my adult life in New Orleans, accepting the position of Lecturer at UK was a homecoming, because I grew up in Murray, Kentucky, and have family here in Lexington. The last several months have been a whirlwind of settling in, organizing my classes, and reacquainting myself with the geology of Kentucky.



This first semester I am teaching GLY 150 Earthquakes and Volcanoes, GLY 120 Sustainable Planet: Geology of Natu-

ral Resources, and GLY 350 Regional Historical Geology. I hope to add Oceanography and more to the list of courses in future semesters. I am trying to incorporate material specific to Kentucky in all of the classes, particularly the Sustainable Planet class. I am impressed by how passionate my students are about issues affecting our commonwealth. I hope to inspire some of them to consider majoring in Earth and Environmental Science. I have also been trying to get out into the field as frequently as possible. I am a paleontologist and specialize in linguliform brachiopods—the phosphatic-shelled brachiopods that we used to call the “inarticulates”. I primarily work on latest Cambrian–earliest Ordovician brachiopods in Utah and Nevada, but having arrived in a place surrounded by brachiopod-rich upper Ordovician strata, I will definitely be expanding my horizons. I am already involved in a project looking at linguliform brachiopods in the Ordovician Fairview Formation in southern Ohio.

I am very happy to be here in my home state where my favorite fossil is also the state fossil!

Kim Schindler

Hello! I'm Kim and I arrived in Lexington at the end of July. I'm very excited to be here in Lexington and part of this department. I'm originally from Bandera, Texas but I've lived in Mississippi the last five years. My husband, Steven, is currently working for the Naval Oceanographic Office in south Mississippi but is going to be joining Ella, our 9 month old daughter, and myself in March, 2012. I finished my B.S. degree in Ocean and Coastal Resources from Texas A&M University at Galveston in 2006 and from there I moved to South Mississippi. I enjoyed my time at the University of Southern Mississippi, but I'm happy to be here at UK. I am currently the lab technician/lab manager of Dr. Kevin Yeager's research group. I've worked with Dr. Yeager since 2003, and continue to enjoy the research we do. I've traveled throughout North America, presented research at many national and international scientific meetings and learned many new techniques since I started. I'm excited to continue and expand our research here at UK, and further our collaborations with new colleagues. Hopefully I'll be able to meet and get to know everyone soon, so please come by for a tour of our new research spaces.



Rast-Holbrook Seminar speakers hosted by the Department of Earth and Environmental Sciences may be viewed at:

<https://ees.as.uky.edu/seminar-schedule>

Alumni Board News

From the Alumni Board Chair

I want to extend a very heartfelt thanks to Liz Haynes whose leadership, dedication and hard work has brought this Board to where it is today. Since we wouldn't let her leave the post, the only way she could get out was to move to Australia! Liz is on an international assignment with BHP Billiton in Perth, Western Australia.

The EES Board has been and continues to be an active group of alums whose goal is to provide benefit to the Department. For those of you who don't know, EES is the **only** department in the College of Arts & Sciences that has an alumni board. This distinction combined with the initiatives the Board has undertaken and the generosity of our alumni has made a strong and positive impression in the College and University. All one needs to do is look at the new faculty and building renovations to know how much the Department has advanced over the last few years-Tiku, the faculty and staff have done a wonderful job.

A special thanks to Tom Spalding and Pioneer Natural Resources for their major gift to the Department. The gift was recognized at a ceremony during homecoming week attended by UK President Capilouto and A&S Dean Kornbluh. The importance of this and other gifts to the Department cannot be understated. Not only do they provide needed support to the Department, they bring recognition and awareness at the administration level.

We look forward to continue working with the faculty, alumni, students and college in the coming year. As you will see elsewhere in this newsletter, the Board's fund raising goal for 2012 is to bring the Geofund balance to \$100,000. This fund provides for badly needed undergraduate and graduate support. Your help in reaching this goal would be truly appreciated!

Steve Sullivan UK Geology '79, '83.

CFO, Carrodino Group
Louisville, KY

Geofund Fund Raising Initiative

At the Fall 2012 board meeting at UK there was much discussion concerning where the alumni board could best focus their efforts to support the Department and the College. Echoing Dean Kornbluh, Tiku, Frank and David, the focus should be on increasing the number of quality geology undergraduates. Based on our successful (thanks to all alumni) endowment last year of the Brown-McFarlan Fund it was agreed that we should choose a single fund for focused fund raising again this year. The **Geofund** was started in 1996 to provide for the enrichment of the educational and

research experience for both undergraduate and graduate students. This broad definition has provided much needed flexibility to permit support wherever needed in the department. The Geofund may be used for undergraduate or graduate scholarships, equipment purchase, field trip support, or whatever is needed. The Alumni Board's goal is to increase the Geofund endowment to \$100,000 by the end of 2012 and **WE NEED YOUR HELP!** Please consider making your annual support to the department designated for the Geofund, or even better, find some additional special support for this important tool to improve the department. Stay tuned for more ideas and events to more fully fund the Geofund!

Curtis G. Hull UK Geology '73 Fund Raising Committee Chair

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Thanks to our Generous Alumni!

Support Opportunities

Your support of the UK Department of Earth & Environmental Sciences helps provide opportunities for our outstanding undergraduate and graduate students. All contributions to the Department are tax deductible.

Rast-Holbrook Fund

Supports the department seminar program, an opportunity for students to interact with researchers outside the department

GEOFund

Supports general departmental needs including undergraduate and graduate scholarships

Wallace Hagan Scholarship Fund

Supports undergraduate scholarships

Glenn Rice Memorial Fund

Supports undergraduate tuition scholarships

Haynes Field-Trip Scholarship Fund

Supports student travel on field trips

Development Fund

Provides resources for graduate student recruitment and alumni development functions

Geology Support Fund

Supports initiatives for long-term quality of the department

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Or you may send donations directly to:

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