

DEPARTMENT OF

GEOLOGY

Alumni Newsletter | Fall 2013

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BAYLOR
UNIVERSITY



DEPARTMENT OF GEOLOGY



August 2013

Dear Alumni and Friends of Baylor Geology:

This letter is my “good-bye” as Chair of the Geology Department, having served for 9 years in this position. The Baylor administration conducted an internal search for a replacement for me, and Dr. Stacy Atchley is the new chair of Geology starting this fall. I can honestly say that this has been an extraordinary experience for me, as the Department has expanded from a Faculty of 11 to the current 16 and as it has increased its stature within both the University as well as nationally. The Department is strategically aligned with the new Baylor plan for growth and improvement in the STEM fields (Science, Technology, Engineering, and Mathematics) vital to its future aspirations of becoming a major research university, and I have been pleased to have been a part of this undertaking.

The Department conducted searches this past year for a tenure-track Assistant Professor in Applied Geophysics and for a senior-level hire in Paleoclimatology; fortunately both searches resulted in successful hires. Dr. Pier Paolo Bruno was hired as a new Assistant Professor from the Institute of Volcanology and Geophysics in Naples, Italy, and Dr. Steve Forman was hired as a new Professor from the University of Illinois at Chicago. Pier Paolo, as our third geophysicist, conducts high-resolution active-source seismic reflection profiling and will start his appointment in January of 2014. Steve Forman studies Quaternary geomorphology and geochronology and will join the Department in June of 2014; he is in the process of moving his lab from Chicago and setting up an OSL (optically-stimulated luminescence) lab at Baylor. Dr. Forman will be hiring a laboratory manager for the OSL lab provided by Baylor University. Dr. James (Jamey) Fulton joined the Department in July of 2013 from Woods Hole Oceanographic Institute as a Research Assistant Professor in organic geochemistry. Dr. Don Parker continues working out of retirement as a temporary lecturer, teaching Mineralogy, Petrology, Volcanology, freshman geology, and Field Camp. Ms. Jamie Ruth rejoined the Department office after an extended maternity leave.

Sadly, we had two individuals leave the Department: Ms. Erin Stinchcomb, our former Administrative Assistant, left at the end of February, 2013 with her husband Gary (Baylor Geology Ph.D., 2012) for Penn State University, and Assistant Professor Dr. Boris Lau will be leaving Baylor University at the end of 2013 to assume a faculty position in the Department of Civil and Environmental Engineering at the University of Massachusetts at Amherst; we wish them both well as they embark on these new stages in their careers.

Our undergraduate program has grown rapidly in the past 2 years to a current level of about 80 students, the majority of which are in the B.S. Geology track, with a small but increasing B.S. Geophysics group. The graduate program has grown to 32 students in residence, divided between 22 Ph.D. and 11 M.S. students. We have

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made a concerted effort to increase both our Ph.D. student recruiting as well as our Ph.D. graduation rate, e.g., this year we graduated 4 Ph.D. students and recruited 7 new Ph.D. students, generously supported by the Baylor Graduate School. However, because our M.S. students continue to be very highly sought after for employment in the energy industry, as well as in environmental/engineering geology and in hydrogeology, we have strived to maintain a healthy balance between the two graduate degree tracks. We have been extremely fortunate in securing sponsorship for Graduate Student (M.S.) Fellowships through generous gifts from Ken and Celia Carlile; Pioneer Natural Resources, Inc.; Anadarko Petroleum Company; Husky Energy, Ltd.; and Dr. Martin Shield (Angel Resources). These sponsorships allowed us to continue to maintain a healthy and vibrant M.S. program while also growing the Ph.D. program.

The Baylor Geology Advisory Board, chaired by Ed Jakubowski and with Victor Carrillo as Vice Chair, have been seeking ways in which Board members can work with the Department and the Baylor Development Office to identify specific needs and to initiate and conduct special fund-raising projects. In the accompanying letter Board Chair Jakubowski highlights their current activities. Dr. Stacy Atchley is offering a field course (for continuing education credits) for alumni out to West Texas this fall as an outgrowth of suggestions made by the Board to have such opportunities for engagement with the Department.

Finally, I will conclude by saying that it has been both a rewarding and (at times) a tiring experience serving as Department Chair the past 9 years. Now it is time to pass the baton to the next Chair.

Please be sure to attend our Baylor Geology Homecoming Events on Friday, October 18, 2013 (and described in more detail in this newsletter) – we hope to see you all there!

Best wishes,


Dr. Steven G. Driese
Chairman

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FROM THE PROFESSORS

Dr. Peter Allen

Part of the 75 miles of canals that feed about 200 million gallons a day to the 37,000 acres of sugarcane. It takes about a ton of water to produce a pound of sugar.



This year John and I and a new PhD student, Tian Xu, continued work on Maui for the USDA/ARS for Dr. Jeff Arnold where we are analyzing potential water loss through water supply canals and reservoirs. Recent population growth on Maui of more than 200 percent in the last 30

years has led to an increase in water demand. Mean groundwater recharge due to irrigation, has decreased 44% due to more efficient irrigation practices. Groundwater recharge is one of the most important factors controlling ground-water availability.

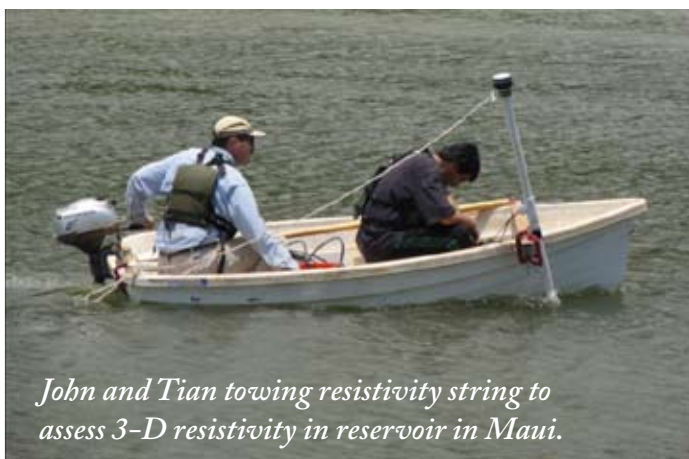


fully operational. Monitoring has involved use of Australian seepage meters, ground resistivity, and reservoir resistivity surveys, as well as flow analysis with new SONTEK IQ water discharge sensors.

On a second front, I have been continuing to work on updates to the SWAT model with Dr. Narasimhan of the Indian Technological University in Madras, India on channel erosion, bedload transport, and sediment routing. This will be incorporated in the model to allow more detailed assessment of watershed scale sediment budgets.

Dr. Jeff Arnold and I continue to upgrade the SWAT-Deg model for use in urban watersheds. Recently we have been working with Dr. Arabi and Jeff Ditty at Colorado State University on a Google Platform eRAMMS which will allow users to access the model using “cloud computing” thereby making access and updating of subroutines easier. The model is currently being beta tested for the platform and should be released this summer.

On the river restoration side, I have been working on a project at the Fort Worth Zoo where I worked with a national engineering firm AECOM and the City of Fort Worth to analyze flooding and bedload transport interrelationships in an effort to reduce flooding the “critters”. I also helped Half Associates in restoration of an historical Dam in the City of Allen, Texas and served as an expert resource with



John and Tian towing resistivity string to assess 3-D resistivity in reservoir in Maui.

Water is brought to the dry central portion of the island from the wetter hillslopes by canals, constructed in the late 1800's and early 1900's. The water is transported by gravity flow in about 75 miles of irrigation canals and detained in about 40 smaller reservoirs prior to application to the 37,000 acres of sugarcane fields through drip irrigation. Loss rates of up to 20% or more of the 250 million gallons of water are attributed to canal and reservoir seepage. This is not an easy task as since the water is gravity driven, the system cannot be stopped for typical ponding studies and all measurements have to be done while the system is

Dr. Mike Harvey on a legal team which assessed erosion and sediment transport in a major dispute on a North Texas Dam project. I'm also working on new ways to assess stream channel erosion potential and am designing new submerged jet apparatus for use by engineering firms and government groups.

Jeff Arnold and I published papers dealing with baseflow in Tianshan Mountains of Northwest China, with sediment transport in landscapes in Brazil, and participated on a great paper by one of our newly graduated PhD. students on sedimentation in the Delaware River.

On the local front, I am looking for students interested in Masters or PhD. work in river assessment and modeling if you hear of any. Family is now scattered across several time zones, Annabel is working on an MBA in Denver at DU, Maggie is a Nurse Practitioner in Ann Arbor, Michigan while her husband finishes up at University of Michigan in the MBA program, Sarah is in Dallas and Peggy continues to move back and forth between Dallas and Waco.

Below: Typical view during a day of field work on Maui. The cane takes about two years to reach maturity. It is then burned to remove excess foliage, and then bulldozed and lifted into trucks to take to the mill which squeezes the cane to remove the sugar water.



Right: A seepage meter constructed for Maui. Winds on the reservoirs could top 50 knots and thus a skirt had to be added to the meters. It was found that in fractured terrain, the seepage meters were problematic.



Above: The island of Maui. The top north side of the Island is where the trade winds arrive bringing the high rainfall rates to the two volcanoes (green area). This water is then collected in a series of parallel canals "gutters" that bring the water to the irrigated area near the center of the island. Tradewinds have decreased over the past 15 years resulting in less water for the island which some attribute to climate change.



The principal is simple, a bag, ½ full of water is measured before and after 12 hours. If the bag, connected to the sealed bottom gains water, the reservoir is gaining. Conversely, if it loses water the reservoir is losing water by seepage.

FROM THE PROFESSORS

Dr. Stacy Atchley



The 2012-2013 academic (and personal) year had a number of highlights for the Atchley family. During the summer of 2012 we took a fantastic trip to the Mediterranean. The highlight for me was a first-hand look at the Roman city of Pompeii, and

the ancient Greek cultural epicenter of Olympus. Pompeii certainly met expectations, including the incredible preservation of Roman architecture, as well as the heat (similar to central Texas in late July) and crowds (similar to Disneyworld in late July). At Olympus, my highlight was watching wife, Janelle, “sprint” the length of the original Olympic oval. I’m fairly certain she could regain her high school sprint form with some effort (yes, she was a sprinter and long-jumper in high school).

My oldest daughter, Dallas, is now a junior at Texas A&M and is studying Anthropology with minors in English and Biology, and hopes to be a high school teacher. Our youngest daughter, Audra, is now in 10th grade at Vanguard College Preparatory School, and is doing well both academically and athletically. Although Audra was injured early during the Fall 2012 volleyball season thus limiting her play, she did start as a Freshman on the varsity basketball team where she earned honorable mention All-District honors. Her crowning athletic achievement though, is that she was a member of Vanguard’s state championship golf team.

At Baylor, I am still active in Triassic research at Petrified Forest National Park (with Steve Dworkin and Lee Nordt), and more recently, in the Paleocene of the San Juan Basin of northwestern New Mexico (with Dan Peppe and Lee Nordt). I also am still heavily involved with petroleum-related projects via Baylor’s Applied Petroleum Studies program. In regards to advisement, my most recent PhD student, Aislyn Trendell, graduated in December of 2012, and is now employed at Anadarko Petroleum in The Woodlands. I’m currently co-advising (with Dan Peppe) PhD student, Adam Davis, and am sole advisor for MS students, Kim Kuipjer and Garrett Felda. In fact, as I type I’m on assignment with Kim on a project involving a Mississippian reservoir in Calgary. I also have four additional top-flight new graduate students that will join me this fall: Brian Crass (MS), son of alumni David Crass, from Texas Tech, Hunter Harlow (PhD) from the University of Kansas, Caitlin Leslie (PhD) from Grand Valley State University, Michigan, and Kieron Prince (MS) from Loma Linda University. I am truly blessed to have such a great group of students. As always, we appreciate our alumni and look forward to seeing you at Homecoming this Fall.

Stacy and Janelle hiking in Calgary, Canada.



FROM THE PROFESSORS

Dr. Rena Bonem

The undergraduate Geology and Geophysics programs are increasing in popularity with a few Earth Science majors continuing in the department. The current number of majors is approximately 85 (we have new transfers coming in every week during the summer). We will lose a few to graduation in August and December, but Rocks and Rock-Forming minerals has about 30 students this fall. That is the largest enrollment since 1981. Depending on how many continue to Petrology, we will probably need 3 labs in the spring. Paleontology and Structural Geology have high enrollments, but the larger numbers will be next fall. If this group stays in geology, we may end up with 2 sessions of field camp in a couple years!

I did go the GSA meeting in Charlotte, NC, last fall and will be in Denver this fall if any of you are in the area, let us know and we can get you free passes into the exhibit hall. Ryan Morgan, a Ph.D. candidate from Michigan, is still on Dr. Beaver's blastoid collections and has two papers ready to be submitted. He is looking at submitting his third paper on floating crinoids in the Austin Chalk which grew out of a senior special problem by John Fisher. Right now he is taking a brief break as his wife gives birth to their first child.

I have also served as the outside examiner on two theses and dissertations from the University of the West Indies in Jamaica: Andrew Ross, Ph. D., The Decline and Restoration of *Acropora cervicornis* in Montego Bay and D. J. Henry, M. Phil., Sea Urchin Abundance and Distribution at Port Royal Cayes, Jamaica.

See photos from Dr. Bonem's field trip to the Paluxy River on page 40.



Much of my time outside of school this spring has been taken up helping my brother and sister-in-law move to Waco. My knee is still bothering me and that limits my diving and fieldwork, but I am still doing agility with Brady (the 4 year-old dachshund-yorkie mix) who now has 5 titles and is still one Jumper's qualifier from his Novice Versatility award. Lady Bug, the schnauzer mix had her DNA blood test and turns out to be a schnauzer, lab, German shepherd, saluki, wire dachshund mix. She is definitely faster than I am and ran at almost 5 y/s in tunnelers last weekend. She started competing in agility in November and has already gotten 5 NADAC titles (competing in the Elite Regular class and got her AKC FAST title at one trial (see picture below). Lady Bug has only found one snake this spring, but she and Brady have taken out 2 squirrels and one possum so far this summer.

As always, I look forward to seeing all of our former students and hope that you will be able to come and visit us soon.



FROM THE PROFESSORS

Sharon Browning



I can't believe another school year is gone! We continue to try and recruit from our freshman courses and reach out to K-12 students. This semester's star party was well-attended by our freshman Earth Science students, in conjunction with the Great Worldwide Star Count. We received permission to hold it at the local arboretum, which has surprisingly dark skies despite its location in a suburb of Waco. The spring skies hold some of the brightest stars in the sky and many deep sky objects. Students had the opportunity to see two planets, the Orion Nebula, many bright stars, and a presentation by the Earth Science TAs (Lauren Michel and Emily Beverly) between viewings.

I have also continued to reach out to local elementary and middle schools about the wonders of earth science and future opportunities for students in the STEM disciplines. We had the opportunity to visit McGregor Elementary School in January of this year. Approximately 60 4th grade students participated in activities that included rock and mineral identification, soil texture, soil profiles and geologic principles, and seismic hazards. Activities were supervised by current and former graduate students (Holly Meier, Hallie Meighan, and Rixang (Alex) Huang). Students were given prepared soil pots with instructions for germinating native seeds and their choice of an individual rock or mineral sample to keep. A set of common rocks and minerals was left with the science coordinator for the school for future use.

We also had a home school group visit us this May, comprised of ~35 4th-7th grade students. Current undergraduate and graduate students as well as representatives from environmental science were on hand to answer questions about individual interests and research for the students, many of whom had limited exposure to science education. Activities

included our popular tsunami tank, the effects of shear motion on two different types of building construction, P and S wave propagation, and a rock/mineral identification and fossil identification. Participants included myself, Ryan Morgan, Lyndsay DiPietro, geology undergraduate Kristina Raley, Melissa Mullins (environmental science), and Jenny Rowlands (grad student environmental science).

One of the important aspects of outreach for me has been the ability to allow the students who visit us to choose their own sample to keep. This has been possible for several years due to the large number of extra samples of common rocks, minerals, and fossils in the department or the addition of samples acquired on field trips. This year we were able to leave a complete set with McGregor Elementary as mentioned previously. In addition, we were able to supply two complete sets to Carrie Wallestad, a former graduate student who is now the only geology instructor at Mongolia International University in Ulaanbaatar upon her discovery that the department had no samples for their students, despite their requirement of a number of geology courses. I look forward to being able to continue all of our outreach activities, as well as my supervision of freshman labs and anticipate a great year this fall!

Home school group visits in May



Ryan Morgan



Lyndsay DiPietro



Demonstrating the tsunami tank for the homeschool group



Melissa Mullins works with the homeschoolers.



FROM THE PROFESSORS

Dr. Vince Cronin



I have agreed to another 9-month stint as the structural geologist at Baylor. I was hired in 2002 “to support the graduate program in petroleum geology.” Formally, Baylor doesn’t have a graduate program specifically in petroleum geology, but rather has a group of faculty members in geology and geophysics who work with the steady stream of students who would like to pursue a career in petroleum geoscience by earning a graduate degree in geology. I have supported their career aspirations through teaching appropriate graduate courses in structural geology and tectonics, and by advising nine Baylor MS students to date -- all of whom now have (or will soon begin) careers in petroleum geology. I have been a member of the American Association of

Petroleum Geologists for almost 35 years. As a doctoral graduate of the Center for Tectonophysics at Texas A&M University, which began as the tectonophysics research group under M. King Hubbert and John Handin at Shell Development Company, I know a thing or two about structural geology as it relates to petroleum exploration and production.

I have also worked professionally in engineering geology, apprenticing under the former State Geologist of California (Dr. Jim Slosson) with whom I worked on interesting projects for nearly three decades. I taught engineering geology as well as structural geology for 14 years before moving to Baylor, and have served as the elected head of the Environmental and Engineering Geology



Division of the Geological Society of America. I continue to be an active participant in that group as well as its sister organization, the Association of Environmental and Engineering Geoscientists.

My background affords me a good perspective on the needs of potential employers of applied geoscientists in petroleum, environmental and engineering geoscience. The optimal degree for a career in the applied geosciences is the Master of Science degree

Dr. Vince Cronin (cont.)

in geology or geophysics. That has been true at least since World War II, if not before, and remains true to this day (www.aapg.org/careers/jobs/preparing.html).

We were informed last fall that the Baylor Graduate School would no longer provide financial support for MS candidates in geology with graduate teaching assistantships. It seems that the Graduate School plans to use all of its resources in pursuit of better institutional rankings from the Carnegie Commission on Higher Education (classifications.carnegiefoundation.org), whose criteria include production of Ph.D. graduates and acquisition of NSF funding but do *not* include production of MS graduates. (Undergraduate programs and general STEM education are also irrelevant to the Carnegie rankings of research universities.) So prestige, money and throughput of doctoral students have become the core motivating values for our graduate programs.

If this decision is sustained in the future, it will effectively end the production of MS graduates in structural geology at Baylor unless external support from alumni or companies is made available to develop MS students in structural geology. Well-qualified potential MS students in the geosciences understand that if a graduate school doesn't want you enough to pay for you, it doesn't want you enough.

While I will be happy to discuss this further with anyone who

would like to engage me on the issue, I do not plan to spend time worrying about matters that I am not empowered to affect in a positive way.

I am motivated by the pursuit of interesting and useful geoscience problems. My research currently includes the search for faults that can produce earthquakes that might hurt people. I am fascinated by the quest to learn new things, but my particular research interest involves geoscience processes that affect people, whether positively (like identifying fracture trends that might help improve the production of groundwater or hydrocarbons) or negatively (like landslides, debris flows or active faults). I am motivated by helping people learn about Earth and the processes by which it changes over time. I especially enjoy helping people who are not normally drawn to the sciences to understand how we know what we know about Earth and its 4.6 billion year history. I love to teach, and spend a great deal of time and effort working on how best to facilitate learning. I am motivated by helping students in our department's degree programs to develop into capable geoscientists. I want to help them learn how to transition between being a teacher-fed student into being a self-directed life-long learner. I want them to be humble in the face of their ignorance, and yet fearless in the quest to dispel that ignorance through hard work and scientific inquiry. I am motivated by a sense of service.

Others might be motivated by prestige or money or throughput, but my motivations are centered on the wonder I experience through the scientific process of making reproducible observations and devising testable explanations for what we observe, on my vocation as a teacher, and on helping other people.

My current MS student, Tyler Reed, and his wife Malvina welcomed their first child— a darling little girl named Maizy — into the world on August 12, 2012. Tyler is adding to our growing knowledge of seismogenic faulting in the north Tahoe-Truckee area along the California-Nevada border, building upon the prior work of Baylor MS graduate Ryan Lindsay. Preliminary results have been delivered at national meetings of the Seismological Society of America (San Diego, 2012), Association of Environmental and Engineering Geosciences (Salt Lake City, 2012), Geological Society of America (Charlotte, NC, 2012), and AGU Meeting of the Americas (Cancun, 2013). He has received funding for his research from SIPES, the Fort Worth Geological Society, and by thesis support from the department. After working to delineate the seismo-lineaments associated with several earthquakes that occurred near Truckee, California, we will be conducting fieldwork later this summer in an attempt to spatially correlate the earthquakes' focal mechanisms with the ground-surface trace of the corresponding seismogenic faults.

Dr. Vince Cronin (cont.)

Tyler plans to defend his thesis by December, and will begin full-time employment as a petroleum geologist with Devon Energy Corporation in Oklahoma City around the first of the year.

Now that we have a computer that has sufficient speed and memory to handle some larger datasets, we plan to begin using LiDAR data in our fault-reconnaissance work. Tyler's thesis document will be completed this year; however, my work on this project will likely continue through 2014 if not beyond. We need to be very careful about publishing any results that indicate the existence of seismogenic faults in a particular area, given the interest and scrutiny that any such interpretation will generate.

I am fully overextended, as usual. I am revising a manuscript accepted for publication in *Numeracy* on the geometry of seismo-lineaments projected onto an arbitrary horizontal plane, incorporating the uncertainties in nodal plane orientation as well as hypocenter location. This derivation was a first step in the process of describing a manual (i.e., using paper, pencil & calculator) method for delineating a seismo-lineament on a topographic map. I am also writing a paper on using velocity data from triplets of GPS stations to determine instantaneous crustal strain for the *Journal of Structural Geology* issue in honor of Dave Wiltschko, which will be published in late 2013 or early 2014. Many of the projects I will be

working on in the coming years will be related to development of educational materials to support university-level geoscience students and teachers. Seven project areas come immediately to mind, and most of the results of these projects will be freely available to people worldwide through the web.

1) The instructional module on using velocities from three GPS stations to determine instantaneous crustal strain has evolved through two pilot studies and several beta tests, and is undergoing a final revision before it is published through the UNAVCO and SERC websites (www.unavco.org and serc.carleton.edu). Members of the development team I've put together with help and sponsorship from UNAVCO will be offering a half-day workshop/short course on the GPS strain module prior to the Geological Society of America annual meeting in Denver this coming October (community.geosociety.org/2013AnnualMeeting/Conference/Courses).

2) The manual process of delineating seismo-lineament swaths will be turned into a laboratory exercise for use in a structural geology course. I will also be working on a Spanish translation of this resource, to facilitate its use in finding seismogenic faults throughout Latin America.

3) I am working on another revision to my primer on

focal mechanism solutions (serc.carleton.edu/files/NAGTWorkshops/structure04/Focal_mechanism_primer.pdf) that will include some of the perspective illustrations I've developed to help explain the SLAM procedures. A PowerPoint document will accompany the text document, for use in classroom presentations. The new version will also be translated into Spanish.

4) My module on Fisher Statistics (serc.carleton.edu/quantskills/activities/Fisher_stats.html) was recently identified as an exemplary educational resource by SERC, and will be revised in accordance with suggestions from reviewers and teachers who have used the module in their classes.

5) As a result of feedback I received at the InTeGrate workshop at the Colorado School of Mines earlier this year (serc.carleton.edu/integrate/index.html), I will be working to create full descriptions of the "gizmos" I have built to illustrate geological or geophysical processes using simple physical-model analogs. Hopefully, John Dunbar will join me in this project, given that he is a talented gizmologist. SERC has set-up a web space for these descriptions that will be available to me as they are prepared.

6) Initial discussions have been held with Jen Wenner and Eric Baer about my helping to expand their NSF-sponsored web resource *The Math You Need When You Need It* (serc.carleton.edu/mathyouneed/index.html) to

Dr. Vince Cronin (cont.)



include some higher-level topics of interest in geoscience courses.

7) I have been working on a textbook on the kinematics of the lithosphere and continental crust, which in its current form is written as a series of chapters that are executable *Mathematica* notebooks. That is, each chapter is a computer file that actually executes all of the equations that are discussed in the chapter. The current version is accessible via bearspace.baylor.edu/Vince_Cronin/www/GradStruct/GradStructHome12.html

And, of course, I will be working with my students and colleagues to continue development and application of the SLAM process to identify seismogenic faults, possibly including the addition of field areas in Colombia, Venezuela and elsewhere in Latin America.

Family News

My daughter Kelly just completed her third year at the University of Notre Dame as a double major: economics and music (vocal performance). She sang a small role in Poulenc's tragic opera *Dialogues des Carmelites*, performed in French this past April at

Notre Dame, and toured with the Notre Dame Chorale this past Christmas. Kelly is currently at the Notre Dame Center in London for a summer term. She will be graduating with two Bachelor's degrees in May of 2015. My son Connor is a rising senior at Reicher Catholic High School, where he is looking forward to his fourth season as their starting goalie on the varsity soccer team. He is also reputed to be the only person in school who can dunk a basketball, and he can do so with one or two hands. Unfortunately for the Reicher basketball team, the basketball season conflicts with the soccer season and Connor likes futbol better. His college search continues, and is narrowing to a list of about 10 schools in California, Oregon, Washington, Utah, Montana and Colorado. Connor is about to start his Eagle Scout project to build some weather-resistant benches in front of St. Philip Parish Church in China Spring, which should be completed by Christmas. In his free time, Connor has been honing his rock-climbing skills on some local limestone cliffs, and continues to be an avid fly-fisherman. Cindy and I are engaged (in all of *our*

free time) in trying to finish the renovation of our house, including the general reduction of stuff accumulated over the years.

Some of my former students might recall meeting my mom while on research trips to the Santa Monica Mountains above Malibu. She passed away in late February of 2013 at age 86½ years. My mom lived for 65 years in the little house in which she (and, later, my siblings and I) grew up, located half a block north of Hollywood Boulevard and three houses south of the surface trace of the Hollywood fault. (The Hollywood fault is a reverse fault thought capable of producing a magnitude 7 earthquake.) My mom was something of an amateur seismologist who had various objects in her house tuned so that they would rattle when small earthquakes occurred. She could estimate the local magnitude by the amount of sound she heard from her various "detectors." When the M6.7 Northridge earthquake occurred in 1994, her home sustained ~\$45,000 in damage, and many of her micro-earthquake detectors were wrecked. Kelly sang beautifully at her funeral.



FROM THE PROFESSORS

Dr. Steve Driese

It has been another very busy year for me with teaching, research, administration and service. In the fall semester of 2012 I taught the graduate GEO 5340 "Paleopedology" course and the graduate GEO 5V90 course "Seminar on Grant Proposal-Writing." In the spring semester of 2013 I taught the GEO 43C1 Senior Capstone Colloquium.

During the summer of 2012, after attending the International Goldschmidt Geochemistry Conference in Montreal, Quebec, I visited the UNESCO World Heritage site at Joggins, Nova Scotia with Dalhousie University colleague Professor Martin Gibling, and Baylor Geology Colleague Steve Dworkin. This site is famous for very large Pennsylvanian fossil trees (see photo) that were buried in growth position by fluvial sand deposits; it is my hope that this might become a future site of research. Later in July, my colleague Lee Nordt and I presented a 2-day short course for ExxonMobil Upstream Research Company in Houston Texas on interpreting soil drainage and soil maturity from paleosols, which we were invited to do by Baylor Ph.D. alumnus Dave Cleveland.

Ph.D. student Lauren Michel (co-advised by Dan Peppe) continued her work on paleosols in Miocene strata in Kenya containing the oldest stem primates, and published her first dissertation paper on pedogenic carbonates and soil organic matter in Vertisols at Riesel, TX in the *Journal of Sedimentary Research*. Ph.D. student Gary Stinchcomb (co-advised by Lee Nordt) completed his Ph.D. dissertation research on the paleogeomorphology of latest Pleistocene to Holocene fluvial deposits in the upper Delaware Water Gap region in PA and NJ, defending in June, 2012; Gary then completed a ¾ year post-doc at Baylor University, continuing work on a soil geochemical database and development of new Paleoclimate proxies. At the end of February of 2013 Gary accepted a post-doc position at Penn State University working with Professor Sue Brantley at the Susquehanna-Shale Hills Critical Zone Observatory; before leaving Gary published his third paper in



Quaternary Research. M.S. student Amos Culbertson completed his M.S. Thesis on Upper Pennsylvanian paleosols cropping out at the Lake Brownwood spillway, defending in the spring semester of 2013 and submitting his thesis as a journal article for review in *Journal of Sedimentary Research*. Ph.D. student Emily Beverly (co-advised with Dan Peppe) spent the summer of 2012 engaged in research involving late Pleistocene paleosols in Kirungu, Kenya; she submitted her M.S. Thesis (completed at Rutgers) for review for publication in *Quaternary International*, and had her Senior Thesis (completed at Trinity) published in the *GSA Bulletin*. Ph.D. student Lyndsay DiPietro spent her summer in 2012 working in central Alaska on latest Pleistocene-Holocene deposits that include important archaeological and paleoclimate sites. Ph.D. student Deb Jennings (off campus) continues making progress on her research involving Upper Jurassic Morrison Formation paleosols in Utah and Colorado and modern barite-bearing modern analog soils in Texas. B.S. thesis student Will Horner completed his Senior Thesis on the clay mineralogy of Miocene paleosols from Rusinga Island; his research was co-directed by Lauren Michel.

My own research continues to focus on interdisciplinary paleoclimate and paleolandscape reconstructions using fossil soils, or paleosols, as well as conducting studies of modern soil systems (especially Vertisols) to develop climate proxies and analogs of ancient soils. I have also developed an interest in using speleothems (cave deposits) as high-resolution archives of late Pleistocene to Holocene climate (see photo). In 2012 I published 5 refereed journal articles and have 11 peer-reviewed journal articles published, accepted or in press for 2013. In 2012 I gave 3 first-authored professional presentations and was co-author on an additional 13

Dr. Steve Driese (cont.)

presentations. I finally completed my co-editing (with Lee Nordt) of an SEPM Special Publications Volume (No. 104) entitled *New Frontiers in Paleopedology and Terrestrial Paleoclimatology*, which is now out in 2013. And I was elected a fellow of the American Association for the Advancement of Science (AAAS) in November of 2012.

During the summer of 2012 my wife Marylaine and I had a working vacation to the International Goldschmidt Conference in Montreal, Québec, followed by a real vacation to Québec City and then on to Halifax, Nova Scotia. Marylaine continues her part-time job as archivist for McLennan Community College – gardening continues to be one of her passions, as well as home improvements. Mary Catherine had an excellent year as a junior at UT-Austin, majoring in Latin American studies and playing on the women's water polo club; she participated in a semester-abroad program in the spring of 2013 attending classes in Antigua, Guatemala, and there got turned on to medical anthropology as a possible graduate school topic. Our oldest son Nathan is still in Lawrence seeking a tenure-track academic appointment while teaching part-time for KU as well as for several colleges in the Kansas City area. Our other son Trevor still lives in Knoxville and works for a mortgage company, but might be moving to St. Louis; he was married in September in Knoxville and we now have a new daughter-in-law, Lindsey. Marylaine and I continue make frequent trips back to the southeast (Tennessee and Georgia) to visit family and friends. We took trips to Albuquerque, NM (On the Cutting Edge teaching workshop), and the Outer Banks of North Carolina (family vacation) during the summer of 2013, and I also squeezed in a trip to Kenya for research with Dan Peppe and Emily Beverly.

Peer-Reviewed Journal Publications:

Ahr, S.W., Nordt, L.C., and Driese, S.G., 2012, Assessing lithologic discontinuities and parent material uniformity within the Texas sandy mantle and implications for archaeological burial and preservation potential in upland settings: *Quaternary Research*, v. 78, p. 60-71.

Dyar, M.D., Carosino, M.L., Tucker, J.M. Brown,

E.A., Clegg, S.M., Wiens, R.C., Barefield, J.E., Delaney, J.S., Ashley, G.M., and Driese, S.G., 2012, Remote laser-induced breakdown spectroscopy analysis of East African Rift sedimentary samples under Mars conditions: *Chemical Geology*, v. 294-295, p. 135-151.

Nordt, L.C., Hallmark, C.T., Driese, S.G., Dworkin, S.I., and Atchley, S.C., 2012, Biogeochemistry of an ancient Critical Zone: *Geochimica et Cosmochimica Acta*, v. 87, p. 267-282.

Stinchcomb, G.E., Driese, S.G., Nordt, L.C., and Allen, P.A., 2012, A mid to late Holocene history of floodplain and terrace reworking along the middle Delaware River valley, USA: *Geomorphology*: v. 169-170, p. 123-141.

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Driese, S.G., and Nordt, L.C., 2013, New frontiers in paleopedology and terrestrial paleoclimatology: paleosols and soil surface analog systems: In *New Frontiers in Paleopedology and Terrestrial Paleoclimatology* (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume No. 104, p. 1-3.

Ashley, G.R., Deocampo, D.M., Kahmann-Robinson, J.A., and Driese, S.G., 2013, Groundwater-fed wetland sediments and paleosols: It's all about water table: In *New Frontiers in Paleopedology and Terrestrial Paleoclimatology* (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume No. 104, p. 47-61.

Breecker, D.O., Yoon, J., Michel, L.A., Dinka, T.M., Driese, S.G., Mintz, J.S., Nordt, L.C., Romanak, K.D., and Morgan, C.L.S., 2013, CO₂ concentrations in Vertisols: variability and shrink-swell: In *New Frontiers in Paleopedology and Terrestrial Paleoclimatology* (S.G. Driese and

L.C. Nordt, eds.): SEPM Special Publication Volume No. 104, p. 35-45.

Li, Z.-H., Driese, S.G., and Cheng, H., accepted, A multiple cave deposit assessment of suitability of speleothem isotopes for reconstructing paleo-vegetation and paleo-temperature: A case study in Raccoon Mountain Cave, USA: *Sedimentology*.

Ludvigson, G.A., González, L.A., Fowle, D.A., Roberts, J.A., Driese, S.G., Villarreal, M.A., Smith, J.J., and Suarez, M.B., 2013, Paleoclimatic implications and modern process studies of pedogenic siderite: In *New Frontiers in Paleopedology and Terrestrial Paleoclimatology* (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume No. 104, p. 79-87.

Michel, L.A., Driese, S.G., Nordt, L.C., Breecker, D.O., Labotka, D.M., and Dworkin, S.I., 2013, Stable carbon isotope geochemistry of Vertisols formed on marine carbonates and implications for deep-time paleoenvironmental reconstructions: *Journal of Sedimentary Research*, v. 83, p. 300-308.

Nordt, L.C., Hallmark, C.T., Driese, S.G., and Dworkin, S.I., 2013, Multi-analytical pedosystem approach to characterizing and interpreting the fossil record of soils: In *New Frontiers in Paleopedology and Terrestrial Paleoclimatology* (S.G. Driese and L.C. Nordt, eds.): SEPM Special Publication Volume No. 104, p. 89-107.

Stinchcomb, G.E., Messner, T.C., Williamson, F.C., Driese, S.G., and Nordt, L.C., 2013, Climatic and human controls on Holocene floodplain vegetation changes in eastern Pennsylvania based on the isotopic composition of soil organic matter: *Quaternary Research*, v. 79, p. 377-390.

Stinchcomb, G.E., Messner, T.C., Driese, S.G., Nordt, L.C., and Allen, P.M., accepted, Using event stratigraphy to map the Anthropocene – An example from the historic coal mining region in eastern Pennsylvania, USA: *Anthropocene*.



Lepidodendron tree stump cast preserved in growth position in Upper Pennsylvanian Joggins Fm. fluvial deposits along sea cliff at Joggins, Nova Scotia. (Hammer for scale).

Sawed half of 15 cm long speleothem (stalagmite) from Raccoon Mountain Cave, near Chattanooga, TN. 11 U/Th ages (micro-drilled) provide chronology for high-resolution paleoclimate record.

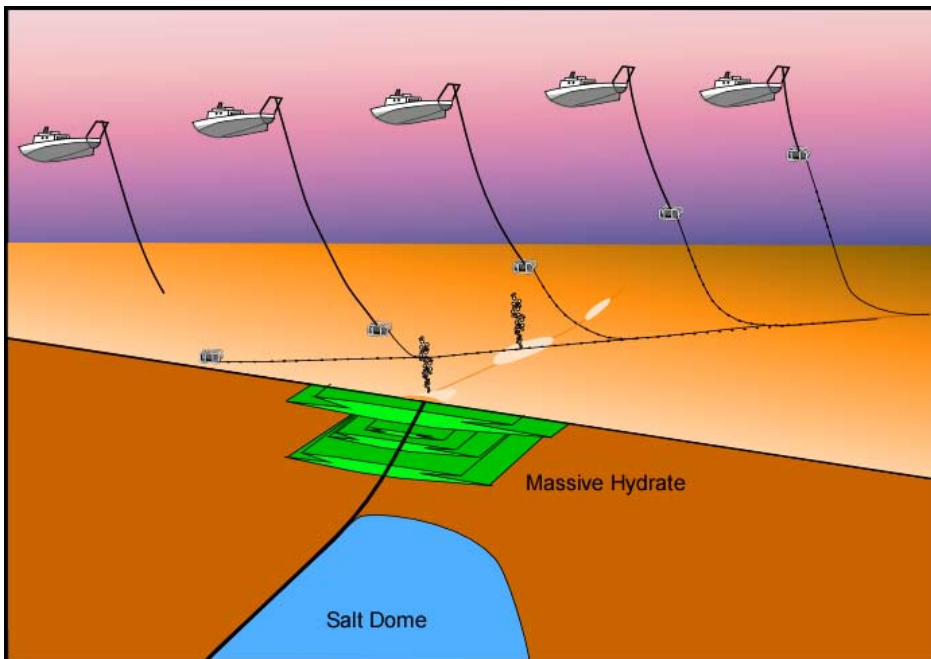


FROM THE PROFESSORS

Dr. John Dunbar



In fall 2013 John Dunbar started his 20th academic year at Baylor and is excited to be taking his first research sabbatical. During his fall sabbatical, John and PhD candidate Tian Xu will begin work on a new DOE grant to study dynamic processes within seafloor hydrate mounds. John and Tian will join colleagues from the University of Mississippi on a research cruise to place an electrical resistivity system on the seafloor at Woolsey Mound, Mississippi Canyon Block 118 (MC118). The system, with its 1 km long electrode array, will be positioned over the active methane hydrate mound, to monitor sub-bottom changes over time (See figure). The system be left to operate autonomously on the bottom for an initial period of six months, during which it will periodically wakeup, record a resistivity profile over the mound, and then go back to sleep until the next recording time. After the initial six months, the system will be recovered and shifted to a second site within MC118 and left on the bottom for another period of six months. In post cruise analysis, the data will be used to construct geophysical, time-lapse movies of sub-bottom changes. In a reconnaissance resistivity survey of the site in 2009, John found evidence for pockets of massive hydrate within the traces of deep-seated normal faults that dissect the mound. Prior work indicates that the mound is a highly dynamic place, where massive blocks of hydrate are periodically extruded from fault traces and out onto the seafloor. The goal of this new project is to record electrical resistivity images of these dynamic processes as they occur as an aid to understanding the inner workings of hydrate mounds.

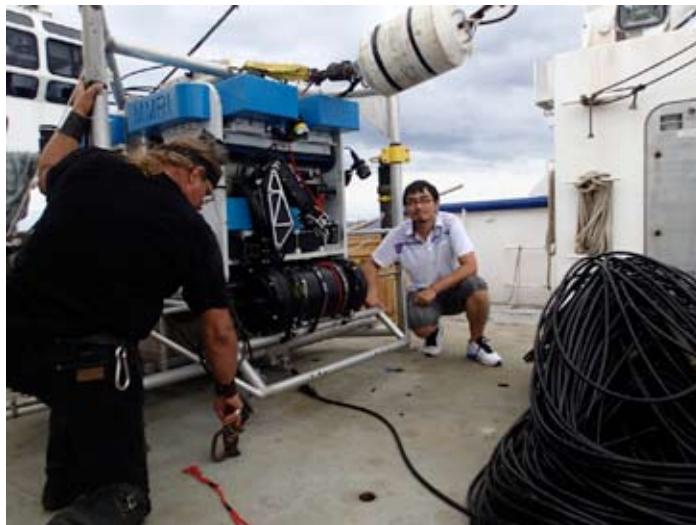


Conceptual diagram of deployment of seafloor electrical resistivity system for long-term monitoring of methane hydrate dynamics.

Along with Peter Allen and Tian Xu, John also continued work on their ongoing hydrogeophysical study of Hawaiian Commercial and Sugar Company's 35,000 acre sugar cane plantation on Maui. Peter and John traveled back to Maui during Spring Break 2013 to finish field work on the island, and John and Tian presented preliminary results of the study at the Symposium on the Application of Geophysics for Engineering and Environmental Problems, held in Denver Co., in March. These results suggest that the rate of leakage in water reservoirs within the plantation has declined by 70% over the last

50 years since the leakages rate were last studied. One possible explanation is that weathering of basalt underlying the plantation due to continuous irrigation has reduced the hydraulic conductivity within the shallow subsurface over time. Peter and John have submitted a follow-up proposal to the USDA to continue the study. They have found Maui a difficult place to work, but feel that the potential scientific gains of working there are worth their personal sacrifice.

The Dunbar family had a joyful 2012-2013. Daughter Tamura finished her Sophomore year at Trinity University. Other than Organic Chemistry she enjoyed her second year. “O Chem” was a “humbling experience”! She is glad to move on. This summer she is compiling information about birds at the Lake Waco Wetlands. Up at 6:30 AM five days a week! We have watched in amazement. Anna continues employment with the City of Waco. She is the Recycling and Public Outreach Administrator for Solid Waste Services. Her experience has shown that there is nothing like talking about trash and recycling to get a lively conversation started. Jessie, the family lab, is in her senior years. Despite a very bad hip, she continues to check the front yard for interlopers. She remains a joy to us.



Seafloor resistivity instrument on summer 2012 cruise to MC118. Graduate student Tian Xu is to the right of the instrument, facing the camera. The seafloor electrode array is ready for deployment on the right side of the photograph.



FROM THE PROFESSORS Dr. Steve Dworkin

Another exciting year has passed. On the home front, Sandy and I are doing well. We went on a ski trip over the Christmas Holiday and Sandy’s new knees performed well. I snuck away a few times and skied some black slopes – old age has apparently not taken too much of a toll yet. We also spent three weeks in the San Juan Mountains in August just hanging out in our trailer and enjoying time with the dogs.

I have just finished a six year stint as the department’s graduate program director and it has been interesting to watch the evolution of the Graduate School’s perspective on research. As many of you know, the new paradigm for graduate education at Baylor emphasizes Ph.D. students at the expense of Master’s programs. This has occurred in conjunction with hiring faculty who are outstanding scientists while at the same time establishing rigorous criteria for attaining tenure that includes the benchmark of obtaining external federal funding. The result is, in my opinion, that the department has reached a new level of intellectual excitement that I never thought I would see here. The down side, of course, is that our traditional Master’s program became imperiled. It is my pleasure to report, that behind a unified faculty front and the extraordinary efforts of Stacy Atchley, it appears that the Master’s program will flourish in the future and be funded both by private donations and to a lesser extent by the graduate school. We have a huge incoming class of graduate students for the Fall semester of 2013, fairly evenly split between Master’s and Ph.D. students.



Dr. Steve Dworkin (cont.)

This year, Greg Rouze completed his senior thesis under my direction. Greg studied the abundance and character of organic matter in modern central Texas soil profiles and he is going on to get a Master's degree in soil science at Texas A&M. My Master's student, Ken Boling is close to completing his thesis. Ken is reconstructing paleoceanographic conditions responsible for the accumulation of organic matter in the Eagle Ford Formation in central Texas. With Don Parker's help, Ken developed XRF methods for quantifying major and trace element concentrations in mudrocks and he has used these data, along with organic geochemistry to document changing redox conditions during Eagle Ford deposition.

I had a busy year teaching Earthquakes and Natural Disasters, Sedimentary Petrology, Isotope Geochemistry, and Aqueous Geochemistry. We had a great group of undergraduates who attended



FROM THE PROFESSORS Dr. Don Greene

As you may recall in last year's newsletter, Don Greene reported that the Aviation Meteorology course is now being taught in the Aviation Sciences Institute. Since this left a vacancy in Don's teaching schedule, a second section of World Geography was added in the fall and spring semesters last year. As a freshman-level class, the additional section of World Geography added more total students to Don's teaching load in comparison to previous years. Don recently attended the 93rd annual meeting of the American Meteorological society. Held in Austin, Texas, over 1400 papers were presented at the convention. Don found the presentations on space weather most interesting, particularly



field camp, and you can see pictures of them elsewhere in this newsletter. Field camp is still my favorite course to teach and I look forward to it every summer. I continue to study organic matter in paleosols and I have recently obtained a little funding to investigate the chemistry and isotopic composition of petrified wood from Petrified Forest National Park. Stacy Atchley and I made a quick trip out to the Petrified Forest this past December and we collected an enormous amount of silicified wood (see photo to the left of Stacy lamenting the heavy samples he is about to carry!). Good thing that we have a sampling permit, because without one it is a \$400 fine per piece of wood!



dealing with new insights on the relationship between solar activity and weather anomalies in the earth's atmosphere. Don also reported no papers were presented at the meeting concerning global warming and increasing levels of carbon dioxide. Every year Don and Alison take a June trip not only to get away from the Texas heat, but also to see new places. After 40 years of camping together,

most places within 600 miles have been thoroughly explored. As a consequence, vacations are further afield, and the summer trip of 2013 was no exception. This year's newly explored territory was a westward reach extending from Reno, Nevada to the Pacific coast of California and Oregon. Interesting sites along the way included Lake Tahoe and a hike to the summit of Donner Pass. (No off-road vehicle in existence can negotiate the house-sized boulder field along the route the Donner Party tried to follow.) Forest fires in northern California obscured Lassen Peak, but Mt. Shasta was visible through the smoky haze. Fortunately, the coastal redwoods were clear, and Don photographed many of the erosional remnants of sea stacks and arches along the Oregon Coast. Sometimes events and circumstances converge in an unexpected way that brings about change in our lives. Last fall Don and Alison's youngest daughter Adriel quit her position as education coordinator at Baylor's Martin Museum of Art. She is currently employed as a tour guide at the Austin State Capitol, with a second part-time position at the Austin Children's Museum. With all of the family living in Austin, Don and Alison have felt a distinct nudge to "relocate the family hearth in a southerly direction." In other words, they are selling the family farm and moving to Georgetown, Texas. Stacy Atchley might have described it best when he characterized the move as a "pre-positioning for retirement."



Top: Alison and Don Greene at Lake Tahoe

Middle: The California redwoods are this big!

Bottom: A sea stack along the Oregon coast

FROM THE PROFESSORS

Dr. William (Bill) Hockaday



The Hockaday Family
This year has been very exciting and eventful for Mary and me. Our biggest news is the birth of our first child. Abigail Noel arrived on December 17, 2012. Her grandparents and great grandparents made the journey from Ohio and Pennsylvania

to visit her in January and February. The spring break was made memorable by visits from 7 aunts, uncles, and cousins from Pennsylvania who all came to Texas to meet Abby for the first time. In June, Abby made the trip to Pennsylvania with us to attend the wedding of her uncle David (Mary's brother), and in August we returned to Ohio for the wedding of her uncle James (my brother). Our family has been truly blessed this year with so many joy-filled occasions. Some of my fondest memories are being made by seeing baby Abigail through all of life's firsts—first bath, first airplane ride, first steps, first words. My first Father's day was wonderful and is surely one that I will never forget.

The Organic Geochemistry Research Team
This year has been another exciting and productive time for the organic geochemistry team. The group continues to grow, our research continues to be published and we are fortunate to receive funding from Baylor and federal agencies. The Nuclear Magnetic Resonance Laboratory was dedicated to Paul Marchand in the Fall of 2012 by Dr. Ken Carlile. Since then, the facility has attracted 5 collaborators from other universities in the US and China. These scientist are able to come to Waco to be trained and use the instrumentation thanks to an Early Career award from the National Science Foundation. The grant has also allowed us to purchase a new sample analysis probe that pushes our capabilities toward smaller samples and higher sensitivity. The new equipment will be installed in the fall 2013 semester. Most recently, Professor Lau and I learned that NSF

Abigail at 6 months



will be funding a new project of ours to study the interactions of aquatic organic matter with engineered silver nanoparticles. With collaborators at the University of Texas, we will evaluate the effects of organic matter on the removal of nanoparticles by drinking water treatment processes.

Ever dynamic, the organic geochemistry lab is currently a team of 8, comprised of a postdoctoral scientist, 3 Ph.D. students, 3 B.S. geology majors, and myself. This newsletter will introduce this year's graduates as well as the current team while highlighting some of their accomplishments.

Graduations and Promotions

Justin Von Bargen (M.S.) is the first master's degree recipient of our group. Justin's thesis research focused on the application of a novel spectroscopy technique to the chemical analysis of charcoal samples. His work in the chemistry lab, combined with field work that was guided by Dr. Joseph White (Baylor Biology Department) culminated in the development of exciting new chemical analysis that allows us to determine the intensity of wildfires that have occurred in the past. Justin was a highly motivated and outgoing student who presented his research at both regional and national meetings of the Geological Society of America, American Chemical Society, and the American Association of Petroleum Geologists. Justin currently lives in Fort Worth, where he is employed as a geochemist with Pioneer Natural Resources. Justin and I continue to work together to prepare his thesis for submission to the journal of *Organic Geochemistry*.

Nicolas Cestari (B.S.) is the first B.S. recipient from our lab. Nick was an active member of the group

for 2 years, assisting both Zack Valdez and Todd Longbottom with their PhD research projects before taking on his own BS thesis research. Nick's work was an ambitious combination of soil sampling in Axtell, TX with stable carbon isotope ratio analysis and molecular analysis of hydrocarbon molecules (alkanes) by gas chromatography. Under Todd's mentorship, Nick was able to demonstrate that the ratio of certain hydrocarbon molecules can serve as a reliable method for determining the relative abundance of grassland and forest vegetation coverage across a landscape. This method will be a valuable tool for Todd Longbottom who plans to apply it to paleosol samples for plant community reconstruction. Nick is currently living in Houston and conducting an internship with Occidental Petroleum. In the Fall, Nick will begin graduate school in the Geology department at Kansas University.

Dr. Jugeshwar Singh Kshetrimayum (PhD) was a member of our team for 1 year. "Jug" as we affectionately called him, came to Baylor from Bangalore India to use his expertise in nuclear magnetic resonance spectroscopy to perform chemical analyses of biomass energy resources with myself and Professor Sung Joon Kim in the department of Chemistry. Jug's research at Baylor culminated in a presentation at the American Chemical Society national meeting and the preparation of manuscript on the chemical transformation of plant biomass into liquids (oils) by thermal pyrolysis. Jug returned to India in June to be married, and to start his academic faculty position in July at India's flagship research university, The Indian Institute of Science.

Current Graduate Students

Zack Valdez is currently taking his PhD candidacy exams and preparing his dissertation research proposal for *The Institute of Ecological, Earth, and Environmental Sciences* (TIEEES) at Baylor. Zack's research interests are in the area of soil carbon storage and cycling. His preliminary work on soil carbon storage in switchgrass plantations was funded by the USDA, and the remainder of his work at Baylor will be funded by a National Science Foundation graduate fellowship. Zack is studying agricultural land-use and management for dedicated biofuel crops is affecting soil carbon storage.

Todd Longbottom working at the fume hood (right) and a colorful array of plant lipids, isolated by ultrasonic solvent extraction (below).



Todd Longbottom (PhD candidate) joined Baylor in fall 2012 and successfully passed his candidacy exam in the spring. He recently learned that his MS thesis research, conducted at University of Cincinnati, will be published (after moderate revision) in the *Journal of Geology*. Todd's interest in molecular fossils has extended our group's expertise into new and exciting areas. In his first year at Baylor, Todd has initiated and mastered a set of elegant chemistry techniques that allow him to extract, separate, identify, and quantify organic molecules that are preserved in ancient soils. These molecular fossils contain a great deal of information about plant communities in deep time, which cannot be assessed by any other means. Todd hopes to work extensively with other members of the Terrestrial Paleoclimate Research Group (Drs. Driese, Nordt, and Peppe) to study the molecular fossil records preserved in paleosol.

Michael Nguyen (PhD candidate) has completed his first year of graduate school and successfully defended an excellent dissertation research proposal. Mike is co-advised by Dr. Boris Lau and I. His research fills a major gap in our understanding of the global carbon cycle. Mike is studying the effects of temperature changes on the rates and mechanisms by which soil organic matter is adsorbed to iron soil minerals. Mike has been a very prolific writer of research grant proposals. He has successfully raised funding for travel to international conferences and his research this summer is funded by the Glasscock foundation.

FROM THE PROFESSORS

Dr. Lee Nordt



Steve, Ahr, Aislyn Trendell, and Gary Stinchcomb graduated with their Ph.D. degrees this past year. They will be sorely missed. I always learn a lot mentoring great students! After having served as my post doc working on a large geochemical data base Gary took a post

doc position at Penn State this past February. Julia Kahmann, a former Ph.D. student of Steve Driese, will be joining me as a post doc to continue where Gary left off. She will be working long distance from Utah and traveling to Baylor periodically. I have a new Ph.D. student coming on board in the fall. Don Esker will continue John Bongino's work at the Waco Mammoth Site. With the arrival of Dr. Steve Forman we will be able to get a better handle on the chronology of deposits surrounding the site.

Garrison is beginning his second year as assistant golf pro at Berry Creek Country Club in Georgetown. He enjoys giving golf lessons and playing in regional professional tournaments. He has reached level 2 towards his PGA membership, which requires 3 levels of training. At that point he is eligible to work as a club pro at a golf course.



Garrison and Kaylee on the beach at Gulf Shores, Alabama



Kaylee has completed her sophomore year at Baylor. She enjoys her Kappa Alpha Theta sorority activities. She is majoring in Apparel Merchandising and will soon be working in the Roots boutique dress shop in downtown Waco. Kaylee just returned from a 10 day Baylor-sponsored trip to Montreal and New York. In addition to learning a lot about apparel design and merchandising, she appears to have spent a lot of money on personal clothing.

Kathy is still working part-time as outpatient surgery admitting nurse at Providence Hospital. She keeps the household running and assists the kids as they move in and out of dorms and apartments. She has been able to travel some with me to conferences, especially enjoying Charlotte at GSA this past year. She still likes planning family vacations for us and this summer we are headed to Blue Ridge Georgia. I look forward to seeing you all during homecoming weekend!

Publications:

- Driese, S.G., Nordt, L.C., Waters, M.R., and Keene, J.L. (2013). Analysis of site formation history and potential disturbance of stratigraphic context at the Debra L. Friedkin archaeological site in central Texas, USA. *Geoarchaeology* 28:221-248.
- Stinchcomb, G.E., Messner, T.C., Williamson, F.C., Driese, S.G., and Nordt, L.C. (2013). Climatic and human controls on Holocene floodplain vegetation changes in eastern Pennsylvania based on the isotopic composition of soil organic matter. *Quaternary Research* 79:377-390.
- Michel, L.A., Driese, S.G., Nordt, L.C., Breecker, D.O., Labotka, D.M, and Dworkin, S.I. (2013). Stable isotope geochemistry of Vertisols formed on marine limestone and implications for deep-time paleoenvironmental reconstruction. *Journal of Sedimentary Research* 83:300-308.
- Weissmann, G.S., Hartley, A.J., Scuderi, L.A., Nichols, G.J., Davidson, S.K., Atchley, S.C., Bhattacharyya, P., Chakraborty, T., Ghosh, P., Nordt, L.C., Michel, L., and Tabor, N.J. (2013). Prograding distributive fluvial systems- Geomorphic models and ancient examples. *In* New Frontiers in Paleopedology and Terrestrial Paleoclimatology, Driese, S. and Nordt, L. (eds.). SEPM (Society of Sedimentary Geology) Special Publication No. 104, pp. 131-147.

- Breecker, D.O., Yoon, Junyeon, Michel, L.A., Dinka, T.M., Driese, S.G., Mintz, J.S., Nordt, L.C., Romanak, K.D., Morgan, C.S. (2013). CO₂ concentrations in Vertisols: seasonal variability and shrink-swell. *In* New Frontiers in Paleopedology and Terrestrial Paleoclimatology, Driese, S. and Nordt, L. (eds.). SEPM (Society of Sedimentary Geology) Special Publication No. 104, pp. 35-45.
- Atchley, S.C., Nordt, L.C., Dworkin, S.I., Cleveland, D.M., Mintz, J.S., and Harlow, R.H. (2013). Alluvial stacking pattern analysis and sequence stratigraphy: concepts and case studies. *In* New Frontiers in Paleopedology and Terrestrial Paleoclimatology, Driese, S. and Nordt, L. (eds.). SEPM Special Publication No. 104, pp. 109-129.
- Driese, S.G., and Nordt, L.C. (2013). New frontiers in paleopedology and terrestrial paleoclimatology: paleosols and soil surface analog systems. *In* New Frontiers in Paleopedology and Terrestrial Paleoclimatology, Driese, S. and Nordt, L. (eds.). SEPM (Society of Sedimentary Geology) Special Publication No. 104, pp. 1-3.
- Nordt, L., Hallmark, T., Driese, S., and Dworkin, S. (2013). Multi-Analytical approach to characterizing and interpreting the fossil record of soils. *In* New Frontiers in Paleopedology and Terrestrial Paleoclimatology, Driese, S. and Nordt, L. (eds.). SEPM Special Publication No. 44, pp. 89-108.
- Ahr, S.W., Nordt, L.C., Forman, S.L. (2013). Soil genesis, optical dating, and geoarchaeological evaluation of two upland Alfisol pedons within the Tertiary Gulf Coastal Plain. *Geoderma*, 192:211-226.
- Ahr, S.W., Nordt, L.C., and Driese, S.G. (2012). Lithologic discontinuities and parent material uniformity within the Texas sandy mantle and implications for the archaeological burial and preservation potential in upland settings. *Quaternary Research*: 78:60-71.
- Stinchcomb, G.E., Driese, S.G., Nordt, L.C. and Allen, P.M. (2012). A mid to late Holocene history of floodplain and terrace reworking along the middle Delaware River valley, USA. *Geomorphology*:169-170:123-141.
- Presentations:
 Nordt, L.C., Atchley, S.A., Dworkin, S.I., Ramezani, J., Bowring, S. (2012). Characterization and interpretation of a well-dated succession of Late Triassic paleosols from Petrified Forest National Park, Arizona. Geological Society of America Meeting Abstract No. 209139. November (2012), Charlotte, North Carolina.
- Nordt, L.C., Waters, M., Forman, S., Bousman, C.B., Driese, S.G. (2012). A soil and paleosol informatics approach to developing paleoclimate proxies. Geological Society of America Meeting Abstract No. 208137. November (2012), Charlotte, North Carolina. (Invited)
- Driese, S.G., Nordt, L.C., Stinchcomb, G.E., and Kuijper, K. (2012). Construction of a Fully Searchable Soils Database Integrating Soil Characterization Data and Whole-Soil Geochemical Data. 2012. 22nd V.M. Goldschmidt Conference, June 24-29, 2012, Palais des Congrès in Montréal. (Keynote Presentation)
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- Atchley, S.A., Nordt, L.C., Dworkin, S.I. Ramezani, J., Bowring, S., and Parker, W. (2012). Tectonic and climatic controls on cyclic alluviation and biologic turnover within the Late Triassic Chinle Formation, Petrified Forest National Park, Arizona. Geological Society of America Meeting Abstract No. 209629. November 2012, Charlotte, North Carolina.
- Dworkin, S.I., Nordt, L.C., and Atchley, S. (2012). Using bulk paleosol organic matter to reconstruct atmospheric $\delta^{13}\text{C}_{\text{CO}_2}$. 22nd V.M. Goldschmidt Conference, June 24-29, 2012, Palais des Congrès in Montréal.
- Meier, H., Nordt, L.C., Driese, S.G. (2012). Late Quaternary alluvial history of the Owl Creek drainage basin: A geomorphic response to environmental change. Geological Society of America Meeting Abstract No. 209363, Charlotte, North Carolina.

Dr. Lee Nordt (cont.)

- Stinchcomb, G.E., Nordt, L.C., Driese, S.G., and Dworkin, S.I (2012). A soil and paleosol informatics approach to developing paleoclimate proxies. Geological Society of America Meeting Abstract No. 205079, Charlotte, North Carolina.
- Michel, L.A., Driese, S.G., Nordt, L.C., and Breecker, D.O., Stable Carbon Isotope Geochemistry of Vertisols Formed on Marine Carbonates and Implications for Deep-time Paleoenvironmental Reconstructions: Paper presented at Soil Survey and Land Resource Workshop, Texas A&M University, February 2-3 (2012).
- Stinchcomb, G.E., Kuijper, K.E., Nordt, L.C., and Driese, S.G. (2012). Construction of a Fully Searchable Soils Database Integrating Soil Characterization Data and Whole-Soil Geochemical Data: Paper presented at Soil Survey and Land Resource Workshop, Texas A&M University, February 2-3, 2012.
- Kuijper, K.E., Stinchcomb, G.E., Driese, S.G, and Nordt, L.C. (2012). Testing the Universal Paleoprecipitation Equation (CIA-K) Using the Newly Constructed NRCS/Baylor Soil Geochemical Database: Paper presented at Soil Survey and Land Resource Workshop, Texas A&M University, February 2-3 (2012).

- Stinchcomb, G. E., Messner, T. C., Driese, S. G., Nordt, L. C., and Stewart, R. M., Pre-colonial (A.D. 1100–1600) sedimentation related to prehistoric maize agriculture and climate change in eastern North America: Paper presented at Middle Atlantic Archaeological Conference, March 22-25, 2012, Virginia Beach, Virginia.
- Stinchcomb, G.E., Messner, T.C., Stewart, R.M., Driese, L.C., Nordt, L.C., and Allen, P.M. (2012). Prehistoric anthropogenic event II (AE-II) and its influence on Earth Surface Processes along the Middle Delaware River Valley, USA.. Geological Society of America Meeting Abstract No. 205079, Charlotte, North Carolina. (Invited)

Grants:

- Pepper, D., Atchley, S., Nordt, L.: EAR #1325552 (\$211,392): Collaborative Research: testing the link between climate and mammalian faunal dynamics in the early Paleocene record of the San Juan Basin, New Mexico. (Awarded)
- Nordt, L., Driese, S., Atchley, S., Dworkin, S., Hockaday, W.: EAR #1338242 (\$930,506): ELT Collaborative Research: Earth System Response to Climate Change: Deep Time Critical Zone Observatory, Petrified Forest National Park, Late Triassic, Arizona. (Pending)

FROM THE PROFESSORS

Dr. Don Parker

Photos From Some Fields Areas Over the Years

One of the benefits of having a long career at Baylor has been to work in some very attractive areas while working with some great students and, occasionally, even having family members along. Starting out, most of my work was concentrated in West Texas, particularly the Davis Mountains. Later, as my interests broadened, I had the opportunity to work in other areas, like New Mexico, Colorado, Oregon, Europe in France and Italy, and most recently, Jordan in the Middle East. Here are just a sample of some past memories. Thanks to all of you!

Heidi Burke leaps off El Cajete Pumice in the Jemez Mountains.



Beth Rinard and Betsy Julian at Aden Crater on a S.A.S.G.S. trip to Kilbourne Hole outside of El Paso.



Kurt Ritch sitting on top of Fisher Mountain after a climb involving bears, Colorado, July 1981

Becky at her folks' cabin in Colorado, Summer 1983



Camp at Storm King Mountain in the San Juans – Travis and Cimarron with their squirt guns while Ayati Ghosh looks on, somewhat disapprovingly.



Camp at Timberline, Middle Sister in Oregon



John Dunbar, Jen Perez and Heather Williamson at Newberry Volcano, Oregon



Jon Price during a backpack on South Sister in the Cascades, Oregon



Cimarron at Mt. Batchelor, Oregon



Above: Minghua at McKenzie Pass, Oregon

Right: John White examines a road cut in the Pantelleria Green Tuff, Italy.



Left: We got to stay at the posh "Pantelleria Volcano Observatory" during our stay in Italy.

Dr. Don Parker (cont.)



Me looking at a two-year-old steaming lava at Mount Etna in Sicily, photo taken by David Adams



Baylor religion professor Joel Burnett examines an iron-age basaltic artifact at the Jordanian Archeological Museum in Amman



Above: A petrology class learning about Valley Spring Gneiss at Inks Lake State Park



Left: Volcanology students on a sandstone ledge overlooking Bandera basalt flows in New Mexico



At the North Rim of the Grand Canyon, the "dirty dozen" of the all-male 2012 field camp smile at the camera.



FROM THE PROFESSORS

Dr. Daniel Peppe



This marks my fourth newsletter since joining the Geology faculty at Baylor. This past year has been a great one both personally and professionally.

Personally, on August

17, 2012, my wife and I welcomed our daughter, Anna, into our family. Over the last year it's been amazing to watch her grow, change, and learn new things. She's been an amazing joy and we're so lucky to have her in our family! Professionally, I was on sabbatical in the spring 2013 semester, which provided me with some much needed time in the lab spent finishing project and also gave me time to travel to the Peabody Museum at Yale University to conduct museum research. I also received funding from the American Chemical Society, Petroleum Research Fund to conduct research on Cretaceous – Paleocene strata in the San Juan Basin in New Mexico and from the National Science Foundation to conduct research on some Miocene fossil sites in Kenya. As I write this, I'm preparing to head to Kenya to conduct fieldwork at several different Miocene and Pleistocene sites near Lake Victoria. I'll report back next year on the results of our fieldwork!

In the fall semester I taught a graduate seminar, "Topics in paleoclimatology: paleoclimate proxies", that was focused the development and application of several different terrestrial and marine paleoclimate proxies. I had a great group of students in the class and it was fun to discuss each topic in detail with the class. This coming fall I'll be teaching a lecture and lab course, "Evolutionary history of plants" and a graduate seminar on climate change, "Topics in paleoclimatology: climate change – past, present, and future."

In addition to teaching, my research program continues to expand. My ongoing research projects in Kenya continue to go very well. Steve Driese and I recently received a 5-year grant from the National Science Foundation to conduct research at several

Anna, Sholly, and me at the beach in California this past February when Anna was about 6 months old.



different early Miocene fossil sites in Kenya and Uganda. We will be working to reconstruct the paleoenvironment and paleoclimate at several early Miocene research sites across East Africa. This work will allow us to test how regional temporal and spatial environmental variability in the Miocene influenced the evolution of early hominids.

This new grant builds on my previous research on Rusinga Island in Kenya, which was focused on testing how paleoenvironmental changes may have influenced the composition of the fauna and adaptive morphologies of early apes in the early Miocene in the Lake Victoria region of Kenya. An exciting result of our project has been the discovery of evidence for the existence of multiple paleoenvironments in direct association of early ape fossils including open woodland habitats and closed-canopy forested ecosystems. Lauren Michel, who I am co-advising with Steve Driese, is close to finishing her PhD. She is in the process of writing up her final results, which document the remarkable occurrence of a dense fossil forest in the same stratigraphic horizon that many important early ape fossils were discovered.

I am also working in Kenya on a collaborative project with researchers from NYU, University of Minnesota, and the University of Queensland to investigate the paleoenvironment of equatorial East Africa during the Pleistocene and its impact on the behavioral evolution of early *Homo sapiens*

Dr. Daniel Peppe (cont.)

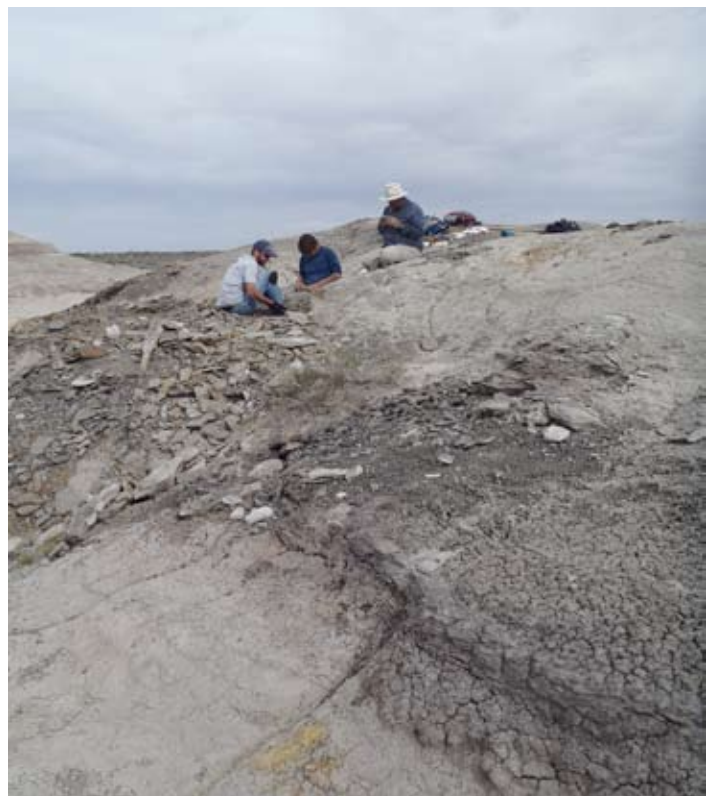
in the Lake Victoria region in Kenya. The results of our work thus far indicate that the Lake Victoria region was significantly more arid than at present during the late Pleistocene causing a major expansion of C4 grassland communities across equatorial Africa. Steve Driese and I are co-advising Emily Beverly, a PhD student, who is examining paleosols at several mainland sites in Kenya to reconstruct the paleoenvironment of the Pleistocene in the Lake Victoria region. Steve and I will be joining her this summer during her fieldwork to work with Emily and our collaborator to collect data necessary to reconstruct the paleoenvironment of the region allow us to test hypotheses about how environmental change affected Pleistocene hominin behavioral evolution.

In addition to my work in Kenya, I have continued to develop a research project in the San Juan Basin in New Mexico. With funding from the American Chemical Society Petroleum Research Fund, I recently conducted fieldwork in May with Stacy Atchley and our PhD student, Adam Davis, and researchers from the University of Nebraska and the New Mexico Museum of Natural History on Cretaceous and Paleocene sediments in the San Juan Basin in New Mexico. The overarching goal of the research project is to explore changes in plant and mammal communities and the relationship between those changes to climate. In this project we are using fossil leaves and geochemical proxies to reconstruct paleoclimate and magnetostratigraphy and ash dates to date the deposits. Adam's PhD project is focused on reconstructing the paleoenvironment of the earliest Paleocene in the San Juan Basin using sedimentology and stratigraphy. Adam is in the field right now and plans to defend his thesis proposal this fall.

I also spent about a month this spring at the Peabody Museum at Yale University studying Paleocene fossil leaves from the San Juan Basin. These analyses coupled with our new fossil leaf collections us to compare the San Juan Basin record to records of floral change across North America to explore the influence of climate on early Paleocene biotic evolution.



Our field party hiking over the late Cretaceous De-Na-Zin Formation in the Bisti-De-Na-Zin wilderness in the San Juan Basin, New Mexico.



Dave Grossnickle, Andrew Flynn, and Tom Williamson (left to right) collecting fossil leaves from the Paleocene Nacimiento Formation in the San Juan Basin, New Mexico.

This past year I advised four undergraduates, Mark McCollum, Dillon DeDegarmo, Blake Taylor, and Will Horner on senior thesis project working in my lab. Mark and Dillon both conducted magnetostratigraphy studies and Blake and Will used paleosols from Kenya to reconstruct paleoenvironments of the Pleistocene and Miocene, respectively. They all did excellent work and plan to become professional geologists!

Although some students are leaving (or will be leaving soon!), my group will be expanding this fall. Andrew Flynn will be joining my lab as a MS student. Andrew will be studying early Paleocene fossil leaves for his MS thesis. Andrew joined us in the field in the San Juan Basin in May, so he'll be able to hit the ground running and hopefully we'll have some new exciting results to tell you about in the next newsletter.

Overall, it's been a great year and I'm excited for my next year at Baylor and in Waco. I hope to see many of you during our upcoming alumni events!

Publications:

- Conrad, J.L., Jenkins, K., Lehmann, T., Manthi, F.K., **Peppe, D.J.**, Nightingale, S., Cossette, A., Dunsworth, H.M., Harcourt-Smith, W.E.H., and McNulty, K.P., 2013, New specimens of *Crocodylus pigotti* (Crocodylidae) from Rusinga Island, Kenya, and generic reallocation of the species: **Journal of Vertebrate Paleontology**, 33: 629-646.
- Danley, P.D., Husemann, M., Ding, B., DiPietro, L., Beverly, E., **Peppe, D.J.**, 2012, The impact of the geologic history and the paleoclimate of the African Great Lakes on the diversification of East African cichlids, **International Journal of Evolutionary Biology**, Article ID 574851: 20 pages.
- Faith, J.T., Tryon, C.A., **Peppe, D.J.**, and Fox, D.L., 2013, The fossil history of Grévy's zebra (*Equus grevyi*) in equatorial East Africa: **Journal of Biogeography**, 40: 359-369.
- Maxbauer, D.P., **Peppe, D.J.**, Bamford, M., McNulty, K.P., Edwards, L., Harcourt-Smith, W.E.H., *accepted*, Paleoclimate interpretations and a morphotype catalog of an Early Miocene flora from the Hiwegi Formation, Rusinga Island, Lake Victoria, Kenya: **Paleontologia Electronica**.

- Peppe, D.J.**, 2013, Hot summers in continental interiors: The case against equability during the early Paleogene: **Geology**. doi: 10.1130/focus012013.1. (Invited Research Focus article)
- Peppe, D.J.** and Deino, A.L., *in press*, Dating rocks and fossils using the geologic record: **Nature Education Knowledge**.
- Royer, D.L., **Peppe, D.J.**, Niinemets, Ü., Wheeler, E.A., 2012, Roles of climate and functional traits in controlling toothed vs. untoothed leaf margins: **American Journal of Botany**, 99(5): 915-922.
- Tryon, C.A., Faith, J.T., **Peppe, D.J.**, Keegan, W.F., Keegan, K.N., Jenkins, K.H., Nightingale, S., Patterson, D., Van Plantinga, A., Driese, S., Johnson, C.R., Beverly, E., Fox, D.L., *in press*, Sites on the landscape: Paleoenvironmental reconstruction of late Pleistocene archaeological sites from the Lake Victoria Basin, Equatorial Africa: **Quaternary International**.
- Tryon, C.A., **Peppe, D.J.**, Faith, J.T., Van Plantinga, A., Nightingale, S., Ogondo, J., Fox, D.L., 2012, Late Pleistocene artefacts and associated fauna from Rusinga and Mfangano islands, Lake Victoria, Kenya, **Azania: Archaeological Research in Africa**, 47: 14-38. doi:10.1080/0067270X.2011.647946.
- #### Presentations:
- McCollum, M.S., **Peppe, D.J.**, McNulty, K.P., Dunsworth, H.M., Harcourt-Smith, W.E.H., Andrews, A.L., 2013, Magnetostratigraphy of the early Miocene Hiwegi Formation (Rusinga Island, Lake Victoria, Kenya): Geological Society of America, Abstracts with Programs: 45(3): 12.
- Beverly, E.J., Faith, J.T., **Peppe, D.J.**, Tryon C.A., Driese, S.G., Blegen, N., Patterson, D., Horner, W.H., 2012, Paleoenvironmental context of Pleistocene archaeological and paleontological sites in Kenya's Lake Victoria Basin: Geological Society of America, Abstracts with Programs: 44(7): 415.
- Horner, W.H., Michel, L.A., **Peppe, D.J.**, Driese, S., McNulty, K.P., Lehmann, T., Dunsworth, H.M., Harcourt-Smith, W.E.H., 2012, Determining depositional heterogeneity through clay mineralogy and particle size analysis of an early Miocene paleo-forest paleosol, Hiwegi Formation, Rusinga Island, Kenya: Geological Society of America, Abstracts with Programs: 44(7): 241.

Dr. Daniel Peppe (cont.)

Jenkins, K., Faith, J.T., Tryon, C.A., **Peppe, D.J.**, Nightingale, S., Ogondo, J., Roure Johnson, C., Driese, S., 2012, New excavations of a Late Pleistocene bonebed and associated MSA artifacts, Rusinga Island, Kenya: *PaleoAnthropology* 2012.

McCollum, M.S., **Peppe, D.J.**, McNulty, K.P., Dunsworth, H.M., Harcourt-Smith, W.E.H., Andrews, A.L., 2012, Magnetostratigraphy of the early Miocene Hiwegi Formation (Rusinga Island, Lake Victoria, Kenya): *Geological Society of America, Abstracts with Programs*: 44(7): 241.

Michel, L.A., **Peppe, D.J.**, McNulty, K.P., Driese, S.G., Lehmann, T., Nightingale, S., Horner, W.H., Dunsworth, H.M., Harcourt-Smith, W.E.H., Lutz, J.A., 2012, Seeing the apes through the trees: Paleoeological reconstruction of a *Proconsul* and *Dendropithecus* site on Rusinga Island, Kenya: *Geological Society of America, Abstracts with Programs*: 44(7): 364.

Michel, L.A., **Peppe, D.J.**, McNulty, K.P., Driese, S.G., Lutz, J., Nightingale, S., Maxbauer, D.P., Horner, W.H., DiPietro, L.M., Lehmann, T., Dunsworth, H.M., Harcourt-Smith, W.E., Ogondo, J., 2012, Paleoclimatic and

paleoecological reconstruction of early Miocene terrestrial equatorial deposits, Rusinga and Mfangao Islands, Lake Victoria, Kenya: *Eos Transactions AGU*: PP31B-2036.

Peppe, D.J., Hickey, L.J., 2012, Unexpected patterns of floral heterogeneity in the Western Interior of North America during the Paleocene, Leaf Summer Working Group, Yale University.

Snell, K.E., **Peppe, D.J.**, Eiler, J.M., Wernicke, B.P., Koch P.L., 2012, Recent advances and on-going challenges of estimating past elevation from climate proxy data: *EOS Transactions AGU*: T24C-07 (Invited Abstract).

Williamson, T. E., Brusatte, S.L., **Peppe, D.J.**, Secord, R., Weil, A. 2012. Early Paleocene climate change and biotic recovery of plants and animals of the San Juan Basin, New Mexico: A preliminary report. *Geological Society of America, Program with Abstracts* 44(6):69.

Williamson, T. E., Brusatte, S.L., **Peppe, D.J.**, Secord, R., Weil, A. 2012. No evidence for conformable contact between the Ojo Alamo Sandstone and the Nacimiento Formation. *New Mexico Geology* 34.

FROM THE PROFESSORS

Dr. Jay Pulliam

My research group has been quite productive in the past year; four are on track to graduate this Spring and Summer. We are finding excellent results from our Texas deployment of broadband seismographs; three students presented their results at a regional meeting of the Geological Society of America in early April and one of those students, Cody Comiskey, defended his M.S. thesis in late April. Cody studied the seismic anisotropy characteristics of Texas and Oklahoma using the recently acquired EarthScope broadband seismic data and was able to correlate surface geological features with anisotropic structures in the Earth's lithosphere and asthenosphere. He will start a job with Anadarko in The Woodlands at the end of May 2013.

Two additional M.S. students who worked with the data we collected across the Gulf Coast Plain will

finish this summer and will also submit manuscripts to leading journals. Dominic Evanzia is performing P- and S-wave tomography in an effort to infer the

history of rifting that created the Gulf of Mexico and the Texas coastal plain. M.S. student Ryan Ainsworth is performing "Receiver Function" imaging, which is analogous to reflection seismic profiling, although with converted waves rather than with reflected waves. The deep pile of sediments that covers the plain has made it difficult to understand the Gulf Coastal Plain's structure and history, but we now have data recorded at an unprecedented scale—both in terms of data volume and station density—so we are making interesting discoveries. The results we are



getting now, three years after the initial deployment, show distinct features. Our challenge now is to interpret the significance and origin of these features. Ryan Ainsworth will start a job with BHP Billiton in July; Dominic Evanzia is looking for a job that will allow him to continue working with earthquakes.

Hallie Meighan, a PhD student who has been studying earthquakes and Earth structure in the northeast Caribbean, recently learned that her second manuscript has been accepted for publication in the Journal of Geophysical Research; her first paper was published in February of this year. Hallie performed a careful analysis of unique data we recorded from ocean bottom seismographs in 2007 to demonstrate that the earthquake swarms that occur repeatedly in the very northeastern corner of the plate boundary indicate that the North American lithosphere is being torn as it subducts beneath the Caribbean plate. Her results have implications for the earthquake and tsunami hazard of the region and for the eastward propagation of the Puerto Rico Trench, the deepest part of the Atlantic Ocean and the most extreme

negative gravity anomaly on Earth.

My long-term research effort nuclear explosion monitoring is being ably aided by Baylor PhD student Mohit Agrawal, who is developing and applying techniques



for jointly modeling receiver functions, surface wave dispersion, and waveforms to constrain lithospheric structure. His first application is to the Middle East and he has nearly completed a manuscript, which we plan to submit to Geophysical Journal International over the summer.

My own research interests took a bit of a turn this year. As part of my long-term effort to unite all the individuals and institutions in the Caribbean and in Central America who do seismology research in collaborative projects, including exchanges of data and expertise, I wrote a proposal with colleagues to NSF that will fund a “Pan-American Advanced Research Institute” (PASI) in Santo Domingo this July. We have accepted 40 applicants from a total of more than one hundred “early career” scientists to join us for two weeks’ of lectures, data acquisition, and analysis. Two Baylor graduate students, Martin Schwed and Frank Sepulveda, have been accepted to attend the PASI. Seismology is an inherently international discipline; it is difficult to make much progress in seismological monitoring or research without combing data from numerous networks and locations. This is particularly true in this “Middle America” region, where countries tend to be small and, in the case of the Caribbean, widely distributed. In addition to common challenges to sharing data and expertise, the region faces unusually dire threats due to earthquakes. The organization we created in 2010 to facilitate collaborations and exchanges was named the “Alliance for Middle America Seismology” (ALMAS) or, in Spanish, “Alianza Mesoamericana de Sismologia”. The PASI in Santo Domingo will be attended by scientists from 10 countries, including the United States, and will be followed by a meeting of ALMAS principals, in order to plan future projects and collaborations.



FROM THE PROFESSORS

Dr. Joe Yelderman



There were many notable accomplishments in the hydrogeology program at Baylor this past year. The main highlight was a trip to northern Uganda. Dr. Joe and Stephanie Wong assessed the groundwater sustainability and

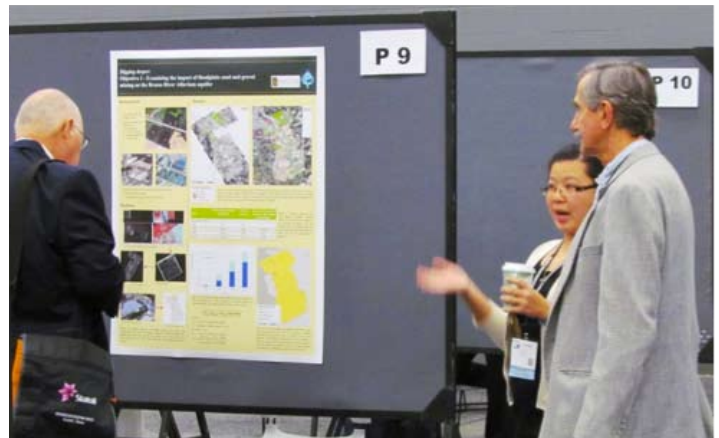
Stephanie taught classes for Restoration Gateway, an organization helping children orphaned from the brutal LRA civil war. Stephanie made two trips as she was recruited by Engineering Ministries International (EMI) to help with the master plan for the orphanage. She presented her work using remote sensing in hydrogeologic interpretations as an oral presentation at the National Groundwater Summit in San Antonio.

The National Groundwater Summit was held in San Antonio and proved to be a highlight for Baylor as MS student David Ju presented his thesis work and received a Farvolden award for outstanding presentation. This was the third time in the last four years that a Baylor hydrogeology student won a Farvolden award at The Summit (Stephanie is a two-time winner). These accomplishments speak directly to the quality of students in the program at Baylor. At the conference Dr. Joe also chaired a session on emerging contaminants and presented a paper on recharge in the Northern Segment of the Balcones Fault Zone Edwards Aquifer.

Dr. Joe took a strong contingent of students to the South Central Geological Society of America meeting in Austin this past spring where David Ju presented orally, Amy Price made a poster presentation, and Stephanie Wong was awarded best student volunteer.

Another highlight this past year was a visit by the Darcy lecturer, David Rudolph. As the distinguished lecturer for the National

Stephanie Wong presenting her thesis poster at the Gulf Coast Association of Geological Society in Austin, Texas.



Groundwater Association, Dr. Rudolph presented his work on agricultural impacts to groundwater and spent time with the current hydrogeology graduate students while he was on campus.

Dr. Joe graduated two MS students in the fall of 2012 and expects a third MS student, David Ju, to finish in December 2013. MS graduate Laura Foss is working in Dallas for a consulting company and MS graduate Amy Price is at Texas A&M working on her PhD in Geology. Dr. Joe welcomed two new graduate students in the fall of 2013; Joshua Brownlow comes with a BS from Texas Tech University an MS from West Texas A&M in Canyon and Josh Kirby comes with a BS from Oklahoma State. Josh Kirby will be working on his MS degree with both Dr. Yelderman and Dr. Atchley as he prepares for a career in flow through porous media; either oil or water. Joshua Brownlow will be working on his PhD in hydrogeology. Josh, and his other brother Josh, will join current MS student Andrew Worsley and PhD student Stephanie Wong. Dr. Joe is also working with PhD biology student Melissa Mullins regarding the effects of small ponds on water quality in the Bull Hide Creek watershed.

Dr. Joe continues to teach hydrogeology and water management classes at Baylor and this past year the water management class worked with the city of Robinson on their water master plan. The Hydrogeology class used the Northern Edwards aquifer as their study area where the Salado Salamander is proposed as a candidate for listing as “endangered.”

Dr. Joe Yelderman (cont.)

The Baylor Wastewater Research Program (BWRP) completed a grant from TCEQ where Dr. Joe was the PI studying new evaluation procedures for different dosing techniques. Dr. Yelderman is also working with Clearwater Underground Water Conservation District and Bell County to study the recharge to the Edwards Aquifer that may affect springs inhabited by the Salado Salamander.

Dr. Joe advised incoming freshmen again this past summer and continues to help Dr. Bonem advise undergraduate geology majors. Dr. Joe also is serving as graduate program director for the Institute of Ecological, Earth and Environmental Sciences (TIEES).

The Yeldermans still live at 706 Woodland West, Woodway, Texas and visitors are always welcome. Dr. Joe continues to teach Sunday School at Columbus Avenue Baptist Church with Diane, his loving wife of 38 years. Diane also continues to teach Kindergarten but is now at Bell's Hill Elementary (where the first Trinity aquifer well was drilled in Waco). Married daughter, Abigail White, lives in Plano with her husband, Jared. Abbi and Jared have a beautiful daughter, Madison (4) and a handsome son, Hamilton (2). Cal (son #1) lives in Austin where he is a business analyst for MitreTech. Logan (son #2) was married August 11, 2012. He and his bride, Rachel, live in Carson City, Nevada, where Logan is working on his Ph.D. in interdisciplinary social psychology at the University of Nevada - Reno.

Recent publications:

Garcia SN, Clubbs RL, Stanley JK, Scheffe B, Yelderman JC, Brooks BW., 2013, Comparative analysis of effluent water quality from a municipal treatment plant and two on-site wastewater treatment systems, *Chemosphere*, 92, 38-44.

Wong, Stephanie S., Yelderman, Joe C., Jr., and Byars, Bruce, 2012, Developing a Geospatial Model for Analysis of a Dynamic, Heterogeneous Aquifer: The Brazos River Alluvium Aquifer, Central Texas, *Transactions of the Gulf Coast Association of Geological Societies and the Gulf Coast Section of the SEPM*, 62nd Annual convention, Austin, Texas, p. 653-660.

Recent Reports:

Joe C. Yelderman Jr., 2013, Changes in on-site wastewater treatment and evaluation: influent equalization, Final Report, TCEQ Contract No. 582-11-99565.

Joe C. Yelderman Jr., 2013, Hydrogeology of the Northern Segment of the Edwards Balcones Fault Zone Aquifer in the Salado Creek Basin and Environs; a current understanding, Preliminary Report, Bell County.

Recent Grants:

Internship with the Southern Trinity Groundwater Conservation District, initial contract Dec. 2012 for January-December, 2013, \$20,328.



Clearwater Underground Water Conservation District, USGS, A&M, Bell County, and US Fish and Wildlife visiting Salado Springs with student Stephanie Wong.



Southwestern University biology professor, Dr. Ben Pierce, leads hydrogeology class to springs in the Northern Segment of the Balcones Fault Zone Edwards Aquifer to see salamanders.



Dr. Joe with orphans from the LRA war at Restoration Gateway in Northern Uganda.



Stephanie Wong with the master planning team from Engineering Ministries International upon return to Uganda.



Ph.D. student Stephanie Wong conducting percolation tests at Restoration Gateway.



Hydrogeology students David Ju and Stephanie Wong at Edwards aquifer outcrop on Hydrodays field trip as part of the South Central Section GSA meeting.



Ph.D. student Stephanie Wong collecting water sample from well at Restoration Gateway.



Hydrogeology class installing mini-piezometers with PHD student Melissa Mullins.

FROM THE PROFESSORS

Dr. Ren Zhang

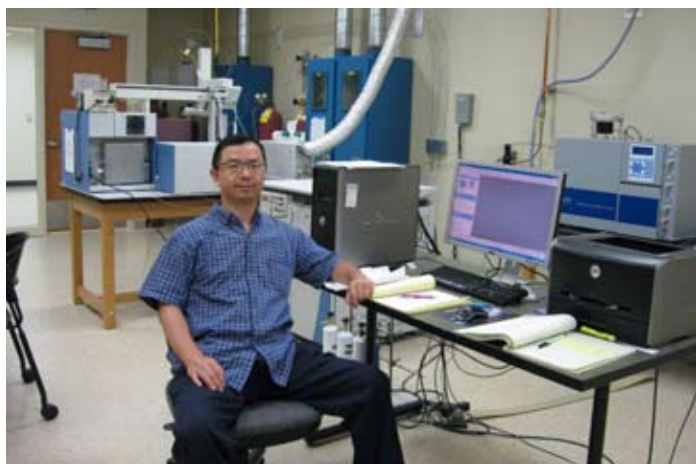


The past year was my third year at Baylor, and was as busy as before. Again, I have tried my best to maintain a smooth performance of the Isotope Ratio Mass Spectrometer (IRMS) and its peripherals. I have had many unexpected mechanic and electronic

problems for the past 12 months, and acid pump failure was the most common one. Almost every time I wanted to use Gas Bench II for carbonate analysis, I had to fix the acid pump. This is because this type of pump is not designed for viscous H_3PO_4 . The most serious problem I have ever had is the filament failure. Although I didn't have to shut down the whole system, I still had to turn the vacuum pump off and open the source housing. After the source was taken out, I had to remove the broken filament and install a new one. When this was done, I put everything back to its original position. However, no trap current was shown after I turned the source on, indicating that there was a small short circuit somewhere. So I borrowed a digital voltmeter trying to find where the short circuit was, but I couldn't find it. This drove me crazy and I had to re-open the source housing and re-do the installation of the new filament. Before I put the source back, I used argon gas to carefully clean the entire mid to lower portion of the source that I have worked with. This might help me solve the problem, and it took me two days to make the IRMS back to normal.

To support ongoing research programs that involve Geology and other Departments, I spent most of my time analyzing H/C/N/O stable isotopic compositions of various biological and geological samples and made over 3000 isotopic analyses. For the first time, over 72% of the annual revenue was generated from external users.

In addition to providing high quality isotopic analyses and other services to both internal and external academic users, I spent rest of time on the FRIP Project, which is about hydrogen isotope analyses of the extracted fluid inclusions. To build up an up-to-date on-line speleothem fluid inclusion extraction device at our laboratory, I first visited Dr Yuri Dublyansky's Stable Isotope Laboratory at University of Innsbruck in Austria in July, where I learned how to install and calibrate a fluid inclusion extraction line and run real speleothem samples on the line. After I finalized the design for our own fluid inclusion extraction line, I began to order parts for the line in August. While waiting for the arrival of the ordered parts, I worked together with Mr. Joe McCulloch at the Metal Shop to make a crusher, a heating block to hold the crusher, a frame to hold the hydraulic ram and the crusher, a modified top adaptor for the TC/EA reactor, and other components. I also worked with Mr. Jerry Milner of the Electronics Shop to design and make a control box for maintaining a constant temperature in both the heating block and the gas housing where the smart cryo focusing unit is located. Unfortunately, the delivery of the smart cryo focusing device, a key component for the speleothem fluid inclusion extraction line, has been postponed to the end of April by the manufacturer. As a result, the design and manufacturing of the gas housing for the smart cryo focusing unit has been delayed accordingly; and the installation, tuning and calibration of the speleothem fluid inclusion extraction line is also a little bit behind schedule. Hopefully the new speleothem fluid inclusion extraction line will be ready for use before December of this year.





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DEPARTMENT OF GEOLOGY

Dear Fellow Alumni and Current Students:

For the next two years, I will serve as Chair of the Baylor Geology Alumni Advisory Board. I have been fortunate over the past several years to come together with Geology Department alumni and faculty twice a year to discuss the status of the Department and plans for the future. I am fortunate to have maintained ties to the Department so many years later and from so far away.

The past year was one of concern for the Department, as outlined in Josh Talbert's address in the previous newsletter. The University, through its *Pro Futuris* vision, seeks to achieve Carnegie Very High Research Activity status. The path to Carnegie Very High Research Activity status would have essentially eliminated the Master of Science degree in geology at Baylor. However, through the efforts of many, the Department secured sponsorship for Graduate Student (M.S.) Fellowships through generous gifts from Ken and Celia Carlile; Pioneer Natural Resources, Inc.; Anadarko Petroleum Company; Husky Energy, Ltd.; and Dr. Martin Shield (Angel Resources). These sponsorships will allow the Department to continue to maintain a healthy and vibrant M.S. program, while also growing the Ph. D. program. On behalf of the Board, many thanks to all those who had a part in keeping the Master's program alive.

In an effort to connect alumni more easily, Joe Whiteside established a LinkedIn group for Baylor Geology Alumni. You can find it by searching for Baylor University Geoscience Alumni. There are currently 39 members and we would like to see that grow this year. This presents a great opportunity to find former classmates and potentially new connections for careers.

Just a reminder that Dr. Stacy Atchley will be leading an alumni geological fieldtrip to the Hueco and Guadalupe Mountains of west Texas and New Mexico from October 8-12, 2013. The title of the fieldtrip is "Outcrop Examples of Conventional Permian Basin Hydrocarbon Play Types in the Hueco and Guadalupe Mountains of Texas and New Mexico: a Sequence Stratigraphic Perspective." Upon completion of the fieldtrip, participants will receive a certificate for 30 hours of Texas Board of Professional Geoscientists continuing education (CE) credit. You can obtain additional information by contacting Ms. Jamie Ruth at the Geology Department.

Ed Jakubowski
Chairman, Baylor Geology Advisory Board



GEOLOGY EVENTS

Field Camp 2013

Left: Taking strike and dip measurements in Ogden, Utah



Right: A big rattle snake got the students attention.



Left: Snack time in Ogden canyon



Right: Drafting up a mapping project in Utah



Left: Setting up camp in the Sawtooths



Right: April Rider prepares dinner in Idaho



Left: Mapping glacial landforms in the Sawtooths



Right: Jordan Dickinson holds a glacial cobble for weathering rind thickness measurement



Field Camp 2013(cont.)



Left: Drafting up projects in the rain



Right: The obligatory Laundromat stop



Left: Life long bonds are always created at field camp. L to R: Randall Bennett, Hunter Allen, Matt McCarter



Right: Water chemistry project at Yellowstone



Left: Water chemistry project at Yellowstone



Right: The day is not over until the project is completed



Left: As you might remember, there is more work than play at field camp



Right: The students examine the Phosphoria Formation in a mine north of Vernal, Utah



Field Camp 2013 (cont.)



Left: Jordan examines a big dump truck

Right: Working in the heat in Utah



Left: Measuring section in Dinosaur National Monument

Right: Last day of mapping near Molas Lake, Colorado



The whole field camp: L to R, rear – Will Fenley, Alex Boggess, Randal Bennett, Hunter Allen, April Rider, Garrett Fletcher, Kevin Wilson; front – Steve Dworkin, Matt McCarter, Jordan Dickinson, Charlie Keracik, Audrey Doane



GEOLOGY EVENTS

Field Trip Summer 2013



Dr. Rena Bonem led students on a field trip to the Paluxy River during the first summer session, 2013.



GRADUATES

December 2012 Graduates

Bachelor of Science in Geology

William H. Horner - Determining Depositional Heterogeneity through Clay Mineralogy and Particle Size Analysis of an Early Miocene Paleo-forest Paleosol, Hiwegi Formation, Rusinga Island, Kenya

Master of Science in Geology

Laura Foss - Interaction Between Floodplain Groundwater and a Constructed Wetland, North Central Texas

Doctor of Philosophy

Aislyn Trendell - Lithofacies Heterogeneity, Fluvial Style Variations, and Floodplain Vegetation Distributions: Deposition and Diagenesis of the Chinle Formation at Petrified Forest National Park, Arizona

May 2013 Graduates

Bachelor of Science in Geography

John M. Karim

Bachelor of Science in Geology

Solon A. Burleson • John C. Duncan

Nick Cestari - Developing a Paleovegetation Proxy along a Forest to Grassland Transition in Central Texas

Clifford Dillon DeGarmo - Magnetostratigraphy of the Tongue River Member in the Fort Union Formation (Paleocene), Williston Basin, North Dakota

Mark S. McCollum - Magnetostratigraphy of the Early Miocene Hiwegi Formation (Rusinga Island, Lake Victoria, Kenya)

Gregory S. Rouze - The Dynamics of Soil Organic Matter in Central Texas Soil Profiles: Implications for Climate Reconstructions Inferred from Paleosol Organic Matter

Master of Science in Geology

Justin Von Barga - Charcoal Chemistry: Developing a Proxy for Paleofire Regimes

August 2013 Graduates

Bachelor of Science in Geology

Blake Taylor - Paleoenvironmental Reconstruction of Late Pleistocene deposits in the Lake Victoria region using clay mineralogy

Master of Science in Geology

Ryan Ainsworth - Sp Receiver Function Imaging of a Passive Margin: Transect Across Texas' Gulf Coastal Plain

Dominic Evanzia - Seismic Vp & Vs Tomography of Texas and Oklahoma with a Focus on the Gulf Coast Margin

Amos Culbertson - Detailed Paleoclimatic Records from Late Pennsylvanian Polygenetic Paleosols: North-Central Texas, U.S.A.

Cody Comiskey - Seismic Anisotropy in Texas and Oklahoma and Its Relationship to Tectonic Events That Shaped Southern Laurentia

Doctor of Philosophy

Hallie Meighan - Seismic Analysis of a Slab Tear in the Northeast Caribbean



Dr. Hallie Meighan and Dr. Jay Pulliam at the August 2013 Doctoral Dinner

AWARDS

Mark McCollum

2013 recipient of the Robert T. Hill Award for Academic Excellence in Geology

Matthew McCarter • John Karim

Chosen to represent the Geology Department at the 2013 College of Arts & Sciences Honors Convocation



Lisabeth (Nicky) Arellano

2013 recipient of the Dixon Undergraduate Field Assistant Award



Above: Matthew McCarter, Dr. Steven Driese and John Karim at the College of Arts & Sciences Spring 2013 Honors Convocation

Left: Nicky Arellano holds a Miocene paleosol sample at a site called Ngira in Karungu in Kenya. Her job was to determine the all of the different Munsell colors and estimate their percentages at each 20-centimeter interval. The colors explain the oxidation/reduction levels of the Miocene paleoenvironment.

WHERE ARE THEY NOW?

Alumni Updates

Colby Wright, (B.S., 2009) who is currently working on his Master's degree at the University of Alaska, Fairbanks writes: "I miss all of you guys back in Texas, and wanted to let you know that I am doing well up here in Alaska."



Melanie McCalmont (B.S. Geography, 2004) went on to graduate school at the University of Wisconsin-Madison in 2004. There she earned an M.Sci in Geography ('06) and another M.Sci in Life Science Communications ('10). While in grad school, she continued to design science-and academic-based websites for UW like she did at Baylor. A few of her major websites include: Lakeshore Nature Preserve at lakeshorepreserve.wisc.edu, a 300-acre campus biopreserve, and a website which won the 2007 international "Places on Line" award from the American Association of Geographers; Gaylord

Nelson and Earth Day (Wisconsin governor/senator and founder of the modern environmental movement) at nelsonearthday.net, a site jointly sponsored by the Wisconsin Historical Society and the Nelson Institute of Environmental Studies; the Journal of Environmental History at environmentalhistory.net; and a re-designed site for the USGS Wisconsin Water Science Center and USGS National Mercury Laboratory at wi.water.usgs.gov. She still designs websites for university departments and academics, such as the president of the American Historical Association, William Cronon. During and after grad school, Melanie worked with the USGS as an IT analyst on the USGS Publications Warehouse, then with a major utility company as a data analyst during their deployment of a statewide smart grid system. She is currently the



WHERE ARE THEY NOW?



federal data coordinator for the State of Wisconsin Department of Public Instruction. All jobs drew in various ways on the GIS spatial analysis, statistics, and historical geography learned at Baylor. Melanie has just completed a manuscript on the history of geologic relief models and has another biography underway for paleontologist and relief modeler Edwin E. Howell. At home, Melanie is envious of her recently-retired husband, Paul; proud of her 13-year-old son, Gavin, who is a State swimmer and loves all things science, and son Jeb Love, 24, who is studying human biology in college after 4 years in Okinawa with Marine Corps Reconnaissance units. Melanie loves Wisconsin weather and does not miss the fire ants!

Jeff Wilt, PG, CPSM, who was in the MS program from 1983 to 1985, has been promoted to Executive Principal of Alpha Testing, Inc. His 200 employee firm provides consulting engineering - geotechnical, materials testing and environmental - to public and private sector clients. The firm has offices in San Antonio, Dallas, Houston, and Fort Worth.

Marcus Staples, MD (M.S., 1977) is currently a physician in Tyler, Texas.

Condolences to...

The family of **John Monroe** who passed away on November 19, 2012. John was a professor in the department from 1956-1959. April 21, 1921 – November 19, 2012.

To the family of **Carl Nelson Roberts** who passed away on August 13, 2012. Carl graduated with his Bachelor's degree in geology from Baylor in 1951, and earned his Master's degree from Southern Methodist University. After many years of service, Carl retired from Shell Oil Company. July 27, 1928 – August 13, 2012.

Congratulations to...

Tyler Reed (current MS student) and his wife, Malvina, on the birth of their daughter, Maizy, on August 12, 2012.

Dr. Daniel Peppe and his wife, Sholly, on the birth of their daughter, Anna Darlene, on August 17, 2012.

Anna (Perry) Banda (M.S., 2007) writes: "Tony and I married on November 11, 2011 in Dallas, and we honeymooned in Scotland and London. We live in



Garland now. I learned I was pregnant by February, and we had our little boy, Tony Dean Banda, Jr., on October 1, 2012 at 12:17 p.m. He was 20.5 inches and 8 lb, 1 oz at birth."



Baby Tony

Dr. Bill Hockaday and his wife, Mary, on the birth of their daughter, Abigail Noel, on December 17, 2012.

Tian Xu (current Ph.D. Student) and his wife, Jade, on the birth of their son, Adam, on March 11, 2013.

Ryan Morgan (current Ph.D. student) and his wife, Christina, on the birth of their son, Ardan, on May 31, 2013.

Jason (PhD, 2011) and Kelly (Jones) Mintz (MS, 2012) on the birth of their son, Jonah, on August 1, 2013.



In Other News...

Joseph Sang, PhD candidate, visited with both Dr. Steven Driese and Judge Ken Starr during their trips to Nairobi this past summer.

MEET THE NEW GUY

Dr. Jamey Fulton



I am excited to be starting a new Assistant Research Professor position in the Department of Geology. My wife and I moved our family to Hewitt in mid-July and are both starting positions at Baylor this fall. Deirdre is an Assistant Professor in the Religion Department, teaching Old Testament and Hebrew and researching the compositional history of the Bible. She is also a zooarchaeologist, examining faunal remains from sites in Israel, Egypt, Yemen and Tunisia to better understand human settlement, trade and feasting. We have a five-year-old daughter who just started kindergarten and 18-month-old son who is in Montessori school.

My research program centers on detecting chemical signatures of biological activity, with the aim of developing organic biomarkers that can help us understand modern biogeochemical cycling and ancient ecology. I analyze organic extracts from all sorts of samples, including microbial mats, water-column particles, soils, sediments and sedimentary rocks. I am most interested in photosynthetic life, as they are the primary carbon-fixers, and focus on pigments, lipids, and their degradation products. I also use compound-specific carbon and nitrogen stable isotope analysis to better constrain biomarker sources and environmental conditions. I am excited to be moving my research program to the state-of-the-art Baylor Science Building and am looking forward to developing new collaborations with other geologists, environmental scientists, chemists, and biologists.

Currently, I am starting a project that aligns well with the Baylor Research Initiative in Terrestrial Paleoclimatology. I have devised some new methods for analyzing organic biomarkers of desert soil crust bacteria that are eroded during wind storms and deposited in lake and ocean sediments. Thus, the molecules can act as terrestrial aridity markers. With a first project completed on Holocene Black Sea sediments, I am turning my attention to studying Pleistocene and Holocene aridity in western North America. The National Science Foundation is funding this research through 2016, and I am giving an initial presentation on this work at the GSA Annual Meeting in Denver. If you are attending, please try to track me down as I'd love to meet some Baylor alums while I'm there.

This fall I will be collecting field samples in Utah, mostly from the Great Salt Lake Desert. I will spend a couple days sampling on Great Salt Lake as well, collecting microbial mats and sediments with assistance from the Great Salt Lake Institute and the Utah Division of Wildlife Resources, who operate a boat on the lake. My primary collaborator on this project is Ben Van Mooy from Woods Hole Oceanographic Institution. For my postdoc, I worked with Ben to develop biomarkers of viral infection of algae in the ocean; for the new project we are designing microbiological experiments to test the controls on lipid and pigment production by cyanobacteria in desert soil crusts.

In addition to research, I look forward to teaching Environmental Geology in spring 2014 and coordinating the GEO5050 seminar. If you are back on campus, please feel free to stop by my office for a visit.

WHERE ARE YOU NOW?



We would love to know! Please complete the form on the back, fold in half, place a stamp, and put it in the mail. We will use this information to update our departmental files. You can also email your information to: Paulette_Penney@baylor.edu.

Also, remember we have the "Geokid" bulletin board in the office with photos of children of Alumni, so send your pictures to Paulette_Penney@baylor.edu.



PLACE
STAMP
HERE

Baylor University
Department of Geology
One Bear Place #97354
Waco, TX 76798-7354

PERSONAL INFORMATION SHEET

DEPARTMENT OF GEOLOGY

Name: _____ Class: _____

Degree(s): _____

Phone: _____ Email: _____

Mailing Address: _____

Type of Work: _____ Location: _____

Company Name: _____

Family Information: _____

Hobbies: _____

Interests: _____

Spare Time Activities: _____

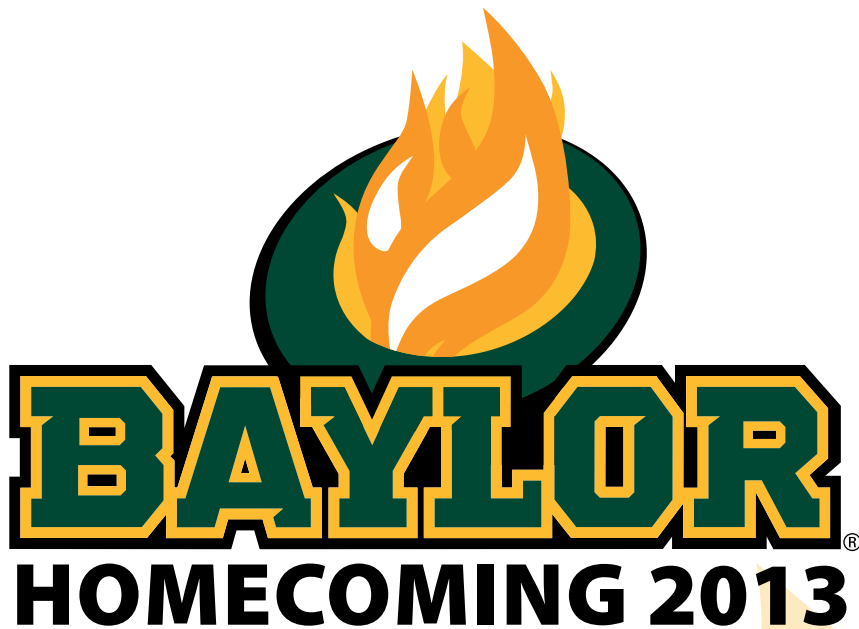
Would you like to share information in the Homecoming Newsletter Section, "Where Are They

Now?" Yes ___ No ___ If yes, write information here: _____

Are you willing to speak to the Department?

Yes ___ No ___ If yes, write topic here: _____

Suggestions: _____



Please join us!

GEOLOGY OPEN HOUSE

Friday, Oct. 18, 2013

7:00–9:00 pm

Baylor Sciences Building, E401



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Department of Geology

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Dr. Steve Dworkin | Professor
Dr. Jamey Fulton | Assistant Professor
Dr. Don Greene | Professor
Dr. William Hockaday | Assistant Professor
Dr. Boris Lau | Assistant Professor
Dr. Lee Nordt | Professor & Dean, College of Arts & Sciences
Dr. Don Parker | Senior Lecturer, Emeritus Professor
Dr. Daniel Peppe | Assistant Professor
Dr. Jay Pulliam | W.M. Keck Foundation Professor of Geophysics
Dr. Joe Yelderman | Professor

Dr. Tom Goforth | Emeritus Professor
Dr. Harold Beaver | Emeritus Professor
Dr. Bill Brown | Emeritus Professor

Sharon Browning | Geology Freshman Laboratory Coordinator
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