Greetings from the Chair

Since it’s July it’s time for an update on the many activities that have occurred this past year in the Department of Geology. On June 6, 45 students, five teaching assistants, and Drs. Hacker and Dasgupta piled into six 15-passenger vans for the two-day trip to the Badlands and then to Spearfish, SD, for our summer fieldcamp course. We now have one of the largest field camps in the nation with 40-50% of the students attending from other Universities. This capstone course continues to be a transformative experience for them with many of our students describing it as a highlight of their education at Kent State University. I know that many of you feel the same way.

In this newsletter you learn about what the faculty have been up to in addition to teaching their usual slate of courses. I’m delighted that our faculty continue to be incredibly productive scientists, doing exciting, high-quality research (in addition to being great people to work with!). In the last 10 years, Geology faculty have been awarded 49 research grants totaling $3.5M, primarily from the National Science Foundation. Based on the most recent data on KSU faculty publications, our faculty have the highest total number of publications (combined papers & abstracts) and highest per capita contribution in the College! In 2012, the Geology faculty published 133 articles and abstracts and, in 2013, the faculty published 98 articles and abstracts. The majority of these publications and abstracts are co-authored with our graduate students. In the past four years we have awarded 38 graduate degrees, which is already five more than the number of degrees awarded over the prior five year period when our graduate program was last reviewed (AY09-10). In essence, our graduate students are publishing and graduating with shorter time-to-completion rates than ever. The names and research topics of this year’s M.S. and Ph.D. students are included in this newsletter. In April, four of our undergraduate students presented research posters at the first ever Undergraduate Research Symposium held at Kent State. Two of them received awards for their presentations and plan to submit their results for publication this fall.

It was unfortunate that the October, 2013, Government shut-down directly affected our students. Dr. Smith’s Invertebrate Paleontology fieldtrip and Dr. Rowan’s Tectonics fieldtrip were both canceled due to park closures and lack of access. Everyone in the department agrees that, next time, Congress should close and the parks should remain open!

In August, Dr. Elizabeth Herndon will be joining us, as our newest faculty member, in the area of Hydrogeochemistry. Beth earned her Ph.D. in December, 2012, from Penn State University and has been a Research Scientist at Oak Ridge National Laboratory for the past year and half. She will be teaching Hydrogeochemistry in the fall and launching her research lab. We look forward to her contributions and to getting to know Beth better starting this fall.

The banquet on May 2 was exceptional (again) this year. Through our endowments, we were able to distribute just over $30,000 in scholarship and research funds to our undergraduates and graduate students. This is a record (by $8000) and a testimony to the commitment and generous contributions of our alumni and friends. Thank you! I had the pleasure of meeting and awarding George Gardner (BS 1970 and MS 1972) with this year’s Distinguished Alumni Award (see below). It’s wonderful that George remains connected with his Alma Mater forty-two years after graduating.

Lastly, at the banquet I had the real pleasure of announcing the new endowment fund entitled “The Palmer Geology Lecture Series” Thanks to a generous contribution from Dr. Don Palmer and his wife Anne, the funds will be used to support a Visiting Lecture Series, dedicated to major issues and advances in geology and environmental science.

I hope you enjoy reading this newsletter. It’s always a pleasure to hear from you and to meet you when you visit the department. If you are in the area this fall, please consider visiting the department on Saturday morning, October 18, during our annual Homecoming Geology Open House.

Sincerely,

Daniel K. Holm, Professor & Chair

July 2014
M.S. Theses Completed
(Fall 2013 - Summer 2014)

Nick Bonini: Comparison of VNIR Derivative and Visible Fluorescence Spectroscopy Methods for Pigment Estimation in an Estuarine Ecosystem: Old Woman Creek, Huron, Ohio (Ortiz)

Nidal Attallah: An investigation of the origin of Rock City and cause of piping problems at Mountain Lake, Giles County, Virginia (Shakoor)

Angie Hull: Geochronology and thermochronology of Precambrian basement drill core samples in Nebraska and southeastern South Dakota (Holm)

AnnMarie Jones: Population dynamics of *Dakoticancer Overanus* from the Pierre Shale, South Dakota (Schweitzer)

Sarah G. Wiles: Nature and Mechanisms of Displacements at the Wolf Creek Dam, James-town Kentucky (Shakoor)

Emine M. Onur: Predicting the Permeability of Sandy Soils from Grain Size Distribution (Shakoor)

Darren Reilly: Identification of Local Ground Water Pollution in Northeastern Pennsylvania: Marcellus Flow-back or Not? (Jefferson and Singer)

Ashley Tizzano: A Geotechnical Investigation of the October 2011 Cedar City Landslide, Utah (Shakoor)

Chelsea Lyle: Petrographical, Thermochronological, and Geochemical Analysis of Pan-African Metamorphic and Shear Zone Rocks in Western Ethiopia and Southern Sri Lanka (Holm)

Frank Mathias: A Plio-Pleistocene Record of Lacustrine Ostracodes from Butte Valley, California: Faunal Responses to Tectonic and Climatic Change (Smith)

Eric Sload: Microwear Analysis of Crab Claw Fingers: A Functional Morphological Approach (Feldmann)

Ph.D Dissertation Completed
(Summer 2012 - Summer 2013)

Emmanuel Nwaodu: Arctic to Pacific Transgressions via the Bering Strait: The Last 22-7 Cal KA BP. Implication for Climate, Melt-water Source, Ecosystem and Southern Ocean Wind Strength (Ortiz)
2014 Distinguished Alumnus

It was a pleasure recognizing George D. Gardner as this year’s Distinguished Alumnus at our annual Spring Banquet. George, a Professional Geologist and Engineer, earned both his BS Geology (1970) and his MS Geology (1972) degrees at Kent State. From 1972-1983, he was employed by GAI Consultants in Pittsburgh, where he worked on engineering geology/hydrogeology-related projects involving slope stability, foundation design, and mine subsidence, etc. From 1983-2006 he was Program and Office Manager, VP, Senior VP, and President at NUS, working on superfund and brownfield sites in more than 30 municipal and non-profit sites. Since 2006 he has been the Deputy Director – Bureau of Waste Site Cleanup – Technical and Financial Services Division of the MA Dept of Environmental Protection. For 32 years, George has been co-leading the Engineering Geology fieldtrip with Dr. Shakoor where students have greatly benefited from his technical knowledge and practical experience. Thank you George!

Fieldcamp students taking their final exam at Grand Tetons National Park. Students listening to David Hacker in the Badlands on the first day of the 2013 Fieldcamp.

The KSGS T-shirts, Polos and Hoodies are officially on sale and all proceeds go to undergraduate scholarships! Email: geology@kent.edu with questions.
KSU Geology Students Participate in the AAPG Imperial Barrel Award Competition

AAPG’s Imperial Barrel Award Program (IBA) was started in 2007 and is an annual prospective basin evaluation competition for geoscience graduate students from universities around the world. This year, for the first time, KSU students competed in the IBA competition that attracted teams from 125 schools from 36 countries, involving nearly 1,000 participants. The KSU team (aka: Black Squirrel Energy) competed at the Eastern Section in Pittsburgh where each team was allowed 25 minutes to give a presentation on the interpretation and assessment of an exploration data package (geology, geophysics, land, production infrastructure, and other relevant materials). The technical evaluation and an exploration strategy were presented in front of a panel of judges comprising top industry experts. During the two months prior to the competition, our team had to, collectively, piece together a basin history that was assigned to them, interpret the 2-D and 3-D seismic data, determine why previously drilled wells were dry, and develop prospects that would be more successful. The competition provided students a unique, hands-on learning experience, using data sets from around the world, allowed them to experience the creative process and work with the high-tech science of the industry today.

KSU’s 2014 Imperial Barrel Award team members  (from left: advisor David Hacker, Catherine Harris, Matt Harding, Julia Yeakley, Eric Traub, and Sebastian Dirringer)
Even though there were no polar vortices in San Francisco, my family and I are still thrilled to be in year 2 of life in Ohio. My wife Gussie went back to work this past Fall as the Director of Intervention Services at a school in Beachwood, and works with students with special needs and their parents to facilitate an optimal learning environment for them. Our daughter Hannah went from crawling to running in what feels like a VERY short amount of time, and loves playing with her friends at daycare. We bought a great house in Beachwood that has a big backyard and we are all looking forward to spending time out there this summer.

In addition to my upper-level classes in mineralogy and geochemistry, I started teaching our Environmental Geology intro course this year. This course focuses on the fundamentals of physical geology (rock types, mineral identification, plate tectonics, etc.), with an emphasis on human interaction with their environment. We explore natural processes and anthropogenic (human-impacted) effects on those processes in the context of natural hazards, natural resources and sustainability. I have received some very positive feedback from students over the past two semesters. The highest praise I received came towards the end of the Spring semester from a student who said that he was a climate science skeptic before taking the class; but now after taking it, he has a much better understanding how humans can impact and change Earth processes, and it has really made him think about how we interact with the world around us.

My research continues to move forward, and I have been fortunate to work with Hasanthi Widanagamage (PhD), Michael Cahill (MS), Eric Traub (MS), Darren Reilly (co-advised MS with Dr. Anne Jefferson) and Sarah Morrison (undergraduate). I was particularly happy to help Darren finish up his MS thesis, which he successfully defended in April. Our group has continued to do field work in the Huff Run Watershed, an acid-mine impacted area south of Canton, and synchrotron-based x-ray analyses at the Advanced Photon Source. We are looking forward to a productive summer field and lab season that includes some conferences, and some well-earned vacation time in August.

This year carried with it a whirlwind of productive research and service opportunities. I accepted my first graduate Master’s thesis advisee, Andrew Gerwitz, in Fall 2013. Together, Andrew and I have constructed a wonderful research thesis project, which involves quantifying and analyzing changes in white-tailed deer bone growth through the Pleistocene and Holocene, hypothesizing that growth fluctuations are tied to climate and environmental change. In addition, I was invited to co-author a review paper with Dr. Daniela Kalthoff, a colleague from the Swedish Museum of Natural History, on sloth and armadillo tooth structure and diet, which I’m happy to say, was recently completed and submitted. Next year carries with it an exciting development in my teaching, as I will be, for the first time, teaching a Selected Topics class on Vertebrate Paleontology. When not teaching or conducting research, my free time was spent caring for my 100-year home in New Philadelphia, deer/turkey hunting, and cheering my hometown Florida State Seminoles to their third national championship in football! Come by and visit anytime to talk about all things geology related!
This past year has been marked by a lot of excitement for Carrie and me. A large number of graduate students, including Ovidiu Franțescu, Adina Franțescu, Adiel Klompmaker, Cristina Robins, and David Waugh receiving PhD degrees, and Ann Marie Jones received her M.S. degree. Currently, we have four other students, Krystyna Kornecki, Eric Sload, Ashleigh Stepp, and Jessica Tashman slated to complete M.S. degrees this year, so things have been exciting on the student front. Jessica worked on Jurassic horseshoe crabs from Poland, Ashleigh studied Pliocene crabs from Curaçao, Krystyna investigated Cretaceous crabs from Mississippi, and Eric developed a whole new field of research looking at wear patterns on crab claws. Several other students are continuing to work (hopefully) on their research.

Carrie and I spent part of last summer in China drawing maps of surfaces containing Triassic fossils and discovered that many arthropod fossils were victims of mass kills – we are still working on the cause of their death. When we finished up in China we took a touristic trip to far western China where we saw the westernmost section of the Great Wall, rode camels, and sampled a culture very different from that of the rest of China. Following that, we went to Poland to investigate the horseshoe crab locality and then to Slovenia to look at collections of Triassic fossils that were very much like the ones from China.

During Spring Break this year, Rod took a graduate student, Evin Maguire, to Peninsula Valdez, Argentina, where we examined Miocene rocks, collected a bunch of crabs, and looked for evidence of “death by ash.” The weather was great, the steaks were beyond compare, and we actually got a lot of work done in association with our Argentine colleague, Silvio Casadio.

All things considered, it was a great year in which we were surrounded by terrific students. It doesn’t get any better than that.
This year I helped to develop a new distance-learning version of the oceanography course that has seen rising enrollments and positive student evaluations. Students learned about climate change on various timescales in my Paleoceanography class. I also worked with Dr. Anne Jefferson, our new hydrologist, David Dees in the Faculty Professional Development Center, and Elizabeth Griffith of the University of Texas Arlington on our NSF Geoscience Education grant to incorporate stable isotopes and instrumentation into our teaching. My fourth doctoral student, Dr. Emmanuel “Chuks” Nwaodua graduated in December. He has one chapter from his dissertation in press, and a second accepted pending revision. He’s working on submission of a third chapter. I have several students who are planning to graduate this summer. In Spring, the trip to WV was the highlight of the Sed Strat Class, although the students enjoyed making turbidity currents in the lab.

I published six peer reviewed papers on water quality and paleoclimate this year. The major focus on my research this year has been on my water quality work, although I travelled to Stockholm to collect paleoclimate data on Arctic cores, and to the Arctic workshop in Boulder, CO to present my work. This summer I am heading out monthly on cruises aboard the USGS RV Muskie to study harmful algal blooms, in conjunction with my former student Dr. Adem Ali (College of Charleston), and my postdoc, Dr. Sushma Parab. Ohio Sea Grant funds this work.

Lastly, I will be finishing up my work as one of the Provosts Faculty Associates for Diversity, Equity, and Inclusion this year.
In my second year at Kent State, I’ve recruited a fantastic group of graduate and undergraduate students and gotten involved with exciting local research projects on urban hydrology. We’re working with Cleveland Metroparks, Holden Arboretum, and the City of Cuyahoga Falls to investigate the efficacy of stream restoration and stormwater management efforts. My lab is humming with activity. I helped organize a “virtual workshop” on the use of laser spectrometry in field hydrology and biogeochemistry and edited a special volume of the journal *Anthropocene* on human effects on geomorphology. I also got to teach new courses in Fluvial Processes and Watershed Hydrology, running field trips down the length of the Cuyahoga River and to the Shale Hills Critical Zone Observatory at Penn State.

This year was also a good year for travel. Along with Dr. Chris Rowan and our 7-year old, we spent time in Minnesota, Oregon, the UK, Ireland, and Antarctica. We were tourists on a cruise along the Antarctic Peninsula in December 2013, enjoying the ice, volcanoes, rocks, and wildlife of the frozen continent, but we couldn’t help but be concerned that the landscape we saw is warming faster than any other place on the globe (nearly 3C in 50 years).

My new students and I will be working on some interesting research projects this summer. These include landslide hazard mapping in the Smokey Mountains National Park, preparing landslide inventory maps for two watersheds in Oregon, where landslides contribute to sediment loading of stream water used for drinking purposes, investigating the 2013 fatal rockfall in Rockville, Utah, characterizing rock mass and evaluating the stability of Mt. Rushmore National Memorial, and investigating elastic versus brittle behavior of clay soils as influenced by water content. In 2013-14, I attended the AEG Annual Meeting in Seattle, Washington, with Nidal Atallah, Emine Onur, Nate Saraceno, Ashley Tizzano, Lindsay Poluga, Catherine Harris, Chelsea Windus, and Matt Waugh. Most of these students presented their research at the meeting and some received awards for their presentations. At this meeting I was honored to receive the Carl and Ruth Terzhagi Mentor Award. Additionally, I attended the GSA Annual Meeting, in Portland, Oregon, with Matt Waugh and Chelsea Windus, where they received Roy Shlemon Scholarships, given by the EEG Division of GSA. Six engineering geology students submitted papers for the 11th Congress of the International Association of Environmental and Engineering Geology, to be held in Torino, Italy, in September, 2014. At least four of them will be attending the Congress.
Donald Palmer

During the last year I served as Interim Dean of the Honors College, working with students and faculty from across all colleges and majors in the University. During the last year we have been able to increase the number of courses offered for Honors and have worked to increase the number of students who take the opportunity to do thesis research in their majors. We also admitted the largest freshman class in the history of the College. While I expected this to be a one year assignment, I have been asked to continue with Honors. However, I have maintained my work in Geology, serving on committees and teaching Oceanography in the fall and giving some guest lectures in Paleolimnology in the spring. I will also be teaching one course in the Department during the fall semester. Last May I was able to travel to Croatia and to the Italian Lake District at the foot of the alps.

Chris Rowan

This year I’ve continued my research into various aspects of the motions of the Earth’s tectonic plates and deformation at their boundaries. I’ve published some of my ongoing research into the motions of the Pacific plate and am getting some exciting preliminary results from a promising new technique for reconstructing the record of ancient earthquakes on the Cascadia subduction zone (and eventually other plate boundaries).

I’ve also had the privilege of working with two enthusiastic graduate students. Matt Harding is finishing up his thesis looking at the formation of the Appalachians; he has presented his research at the AGU and AAPG annual meetings, in between spending a lot of time in the lab playing with a sandbox deformation model. PhD student Chenjian Fu is starting to look at new ways of using paleomagnetic data to reconstruct past motion of the Earth’s tectonic plates, and estimating how (in)accurate reconstructions of past supercontinents might sometimes be.

My teaching year has been mostly fun but also challenging at times, particularly when a planned Fall Tectonics field trip to Shenandoah National Park did not survive the sequester. I’m looking forward to teaching an all-new course on Natural Hazards and Disasters this Fall, and Geophysics in the spring will be livened up by the new field magnetometer I’ll be building this summer.
Alison Smith

I continue to work on projects using ostracodes as paleoclimatic and hydrologic tools in reconstructing Pliocene through Holocene aquatic environmental records. The ostracode database work continues through the NEOTOMA project (Neotoma is the genus name for packrats!) and if you want to see what that database is like, just go to www.neotomadb.org and take the tour! Neotoma is an online hub for data, research, education, and discussion about paleoenvironments.

Kevin Engle and Frank Mathias are in the final stages of their M.S. theses, and I expect they will be graduating this year. Kevin’s thesis concerns a Younger Dryas ostracode record from a small lake in Vermont which will provide the first Late Glacial and Holocene ostracode species profile from New England, and Frank is finishing up his thesis on the Plio-Pleistocene ostracode record from Butte Valley, California, a paleolake with a 3 million year record.

I continue to serve on the EarthCube Data Facilities Council, and as Vice-Chair of the U.S. National Committee for INQUA. In August, I will become President of AMQUA, the American Quaternary Association. Invertebrate Paleo still occupies me during the Fall semester! This spring semester, I taught Paleolimnology for the first time in a few years, and we had a great time- see fieldtrip photo for a view of sampling vernal ponds in May! Please contact me with your own news, I am always interested in hearing from past students and catching up!

Ted Dasgupta

This year has been exciting in terms of teaching and research. It started with another successful year of teaching field camp at the Black Hills with Dr. David Hacker. We had the highest number of students from outside Kent State this time and we expect to grow bigger! Also, apart from the usual Earth Material series and Earth Dynamics courses, I had the chance to teach Geochemistry once again. My students did very well and I am looking forward to teaching it again in a year. On the research front I mentored undergraduate student Owen Jensen for his undergraduate research. His research involved examination of petrographic thin sections of garnet bearing rhyolites from the Northern Black Hills Igneous province. Owen did a splendid job which he presented at the Undergraduate Symposium on Research, Scholarship and Creative Activity at Kent State University. Also, Dr. David Hacker and I authored an abstract at the Geological Society of America National meeting last year. However, the biggest news of my life from last year is that of the arrival of my son, Aidyn Rayan Dasgupta. I am sure our new baby, courses and research will keep me busy during the coming academic year.
In addition to my usual courses I also taught the Contaminant Hydrogeology and Hydrology course this spring, introducing students to environmental site investigations and human health risk assessments. The field trip to Mammoth Cave National Park continues to be the highlight of the Hydrogeology class with 27 students enjoying the “indoors” of geology. The weather was excellent as we explored karst landforms and springs on the surface before venturing underground for six hours to study the formation of different cave levels, including the present level of Echo River with its blind fish and grayfish. At field camp, we had another enjoyable field season of mapping exercises, rock studies, and eating at Sanford’s. The field camp continues to remain strong in popularity with 40 students attending last summer, many from other universities. It is always enjoyable to have so many students from a variety of backgrounds come together for the common goal of studying geology in the field.

In research, I continue to work on projects involving magma emplacement in laccoliths and calderas and the geologic hazards associated with their eruptions. In Utah I am working with colleagues from the Utah Geological Survey mapping one of the largest gravity slides (a mega landslide) in the world (>3400 km²) that formed around 22 to 21 million years ago as part of a sector collapse of the southern Marysvale volcanic field. We are naming it the Markagunt gravity slide after exposures in the Markagunt Plateau where John Anderson and his students earlier mapped scattered deposits of what he named the Markagunt Megabreccia. Last summer I discovered pseudotachylyte layers and dikes which are glass formed by frictional melting along shear planes, indicating emplacement of this gigantic sheet was catastrophic in nature. Our data are being published in the Panguitch and Beaver 30’x60’ quadrangles through the Utah Geological Survey. I am also continuing my research (with Dr. Dasgupta) on emplacement of laccoliths, dikes, sills, and diatremes in the northern part of the Black Hills of South Dakota. Our studies show that the laccoliths form by incremental growth of stacked sills instead of the conventional idea of one magma pulse.

Besides revamping Sedimentary Petrography for the PowerPoint era (I haven’t been teaching it that often lately!), I worked with Dr. Shakoor on a project about variability in engineering data and ways of displaying it. I’ve also been continuing to work on programs and text for statistics for Scientific Methods. My daughter has spent the last academic year in one of Kent’s foreign study programs, at Bordeaux, France, so my wife and I are visiting her in late May, to see how she’s doing.

2014 Homecoming
This fall KSU homecoming is Saturday October 18.
It was great to see the following alumni at the 2013 homecoming: Jim Lawson, 70; Roger Ihle, ’84; Bill Mackey, ’67; Drew Lonergan, ’87; and Bob Beal, ’71.