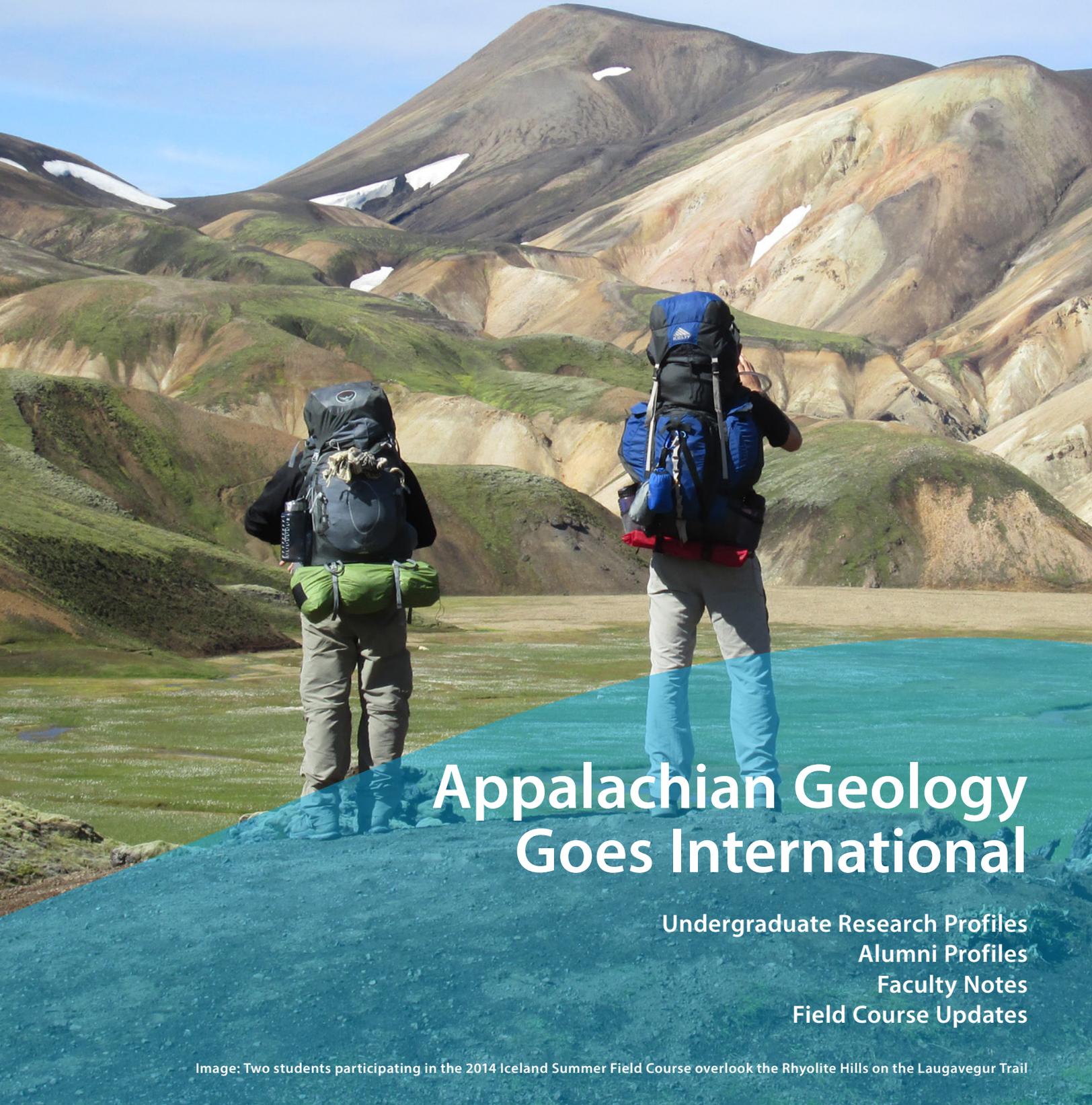




APPALACHIAN GEOLOGY

NEWSLETTER
2015



Appalachian Geology Goes International

Undergraduate Research Profiles
Alumni Profiles
Faculty Notes
Field Course Updates

Image: Two students participating in the 2014 Iceland Summer Field Course overlook the Rhyolite Hills on the Laugavegur Trail

Greetings from the Chair



Bill Anderson

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Happy 2015 to all of our Appalachian Geology students, alumni and friends!

The Department has seen some changes this year. After 36 and a half years as a member of the Geology faculty, Rick Abbott retired on 31 December. He came to Appalachian in 1979 from Harvard University, where he earned his Ph.D., and has been in Boone ever since. Rick was well known around here for his mineralogy and crystal chemistry courses, and also for his occasional Spring Break field trips to the Caribbean. Future students are unlucky to miss out on those trips. Even as he begins his retirement, Rick is leading a field trip in February in the Dominican Republic as part of the International Ecogite Conference in Rio San Juan. If you can be in Boone on Friday, 27 February at 4:00 pm, we will be having a retirement reception for Rick in the Rankin South Atrium outside of the McKinney Museum. We will be providing refreshments and it will be a good opportunity to thank Rick for his years of service to Appalachian Geology. I wish Rick the best in his retirement. Rick, you will be missed!

We are midway through the 2014-15 academic year and the Department of Geology is continuing to thrive. Our current estimate is 120 majors spread amongst our six different degree tracks. As far as I can tell, we are the largest undergraduate program in North Carolina. We had 30 graduates during the 2014 calendar year, the most in the Department's history. Our classes are doing well. We are teaching nearly 700 introductory students this semester and nearly 300 students at the upper level, where the diversity of our course offerings continues to grow. This fall will see a new course, Dinosaurs: Then and Now, offered in the revised General Education curriculum. We expect this to be a popular class. A new course cross-listed with Environmental Science, Environmental Management and Impact Analysis, continues our role as a leader in environment-related courses at Appalachian and will be offered Spring 2016.

Our faculty continue to do quality, internationally-recognized research. Faculty members Johnny Waters and Sarah Carmichael spent the month of August on a research expedition to Mongolia, accompanied by geology student Cameron Batchelor '16. Andy Heckert spent the fall semester in Argentina, working at several new field areas and a variety of museums. Chuanhui Gu's research on greenhouse gas emissions from lawns was picked up by a number of publications in the United Kingdom, including *The Independent*. Johnny Waters continues to make strides in specimen visualization, and is the first faculty member that I know of from the Department to have an art exhibition on campus. The show, *Extinct Life*, featured work on blastoids by Johnny and his students. Scott Marshall is leading the Ventura Special Fault Study Area for the Southern California Earthquake Center. Finally, Emeritus Professor Fred Webb, Jr., was named a GSA Fellow at the GSA Annual Meeting in Vancouver. These are just a few examples of what our faculty have been doing lately.

And then, of course, there are field experiences for our students, local to global. Summer 2014 saw the return of the Appalachian Geology field camp to Italy after a twelve-year absence. Fifteen students took part in the initial class and sixteen have booked slots in the 2015 camp. We also saw the first iteration of our Iceland field course, which offered introductory Environmental Geology credits to non-majors. Fourteen students participated in this course, which included a five-day backpack trip through a glacial and volcanic valley. This summer's course will again offer introductory credit for non-majors, but we will also be offering an upper-level opportunity for our geology majors. Finally, Andy Heckert completed his ninth Triassic Trip to New Mexico and Arizona. To be sure, Appalachian Geology is a major player in international education and field courses at ASU.

I encourage you to flip through the pages of the newsletter to see what else the faculty and students of Appalachian Geology are working on. Please keep in touch with us and if you find yourself in Boone, please stop by for a visit. As always, thank you for your support of Appalachian Geology.

Bill Anderson

Selected Student Presentations, 2014

American Geophysical Union Fall Meeting, San Francisco, CA

“The distribution of fault slip rates and oblique slip patterns in the Greater Los Angeles, CA region”, Hugh Harper ‘15 and faculty mentor Scott Marshall

“Quantifying Walker River stream temperature variability using distributed temperature sensing data”, Alex Beck ‘15 with Utah State University mentor Sarah Null

Geological Society of America Annual Meeting, Vancouver, Canada

“Exploring Early Miocene African Catarrhine evolution through paleoenvironmental reconstruction, Loperot, Kenya”, Oliver Burns ‘14 with faculty mentor Cindy Liutkus-Pierce and others

Geological Society of America Southeast Section Meeting, Blacksburg, VA

“Hyporheic exchange and nutrient uptake in a forested and urban stream in the Southern Appalachians”, Chase Batchelor ‘13 with faculty mentor Chuanhui Gu and others

“Magnetic characterization of coal ash and trace metal concentrations in river sediments contaminated by the Kingston spill”, Daniel Gaspari ‘14 with faculty mentor Ellen Cowan and others

“Phylogenetic signals in phytosaur tooth enamel microstructure and implications for Newark Supergroup phytosaurs”, Devin Hoffman ‘17 and Jessica Miller-Camp ‘07 with faculty mentor Andy Heckert

“Temperature surge characteristics in a dynamic and urbanized headwater stream”, Claire Harris ‘14 with faculty mentor Bill Anderson

Current Scholarship Holders

Undergraduate Research Assistantships

Cameron Batchelor ‘16, Taylor Craig ‘15, Hugh Harper ‘15, Laura Heinen ‘16, Devin Hoffman ‘17, Hannah Krueger ‘17

Mark DeBroder Memorial Scholarship

Sonia Sanchez-Lohff ‘14

McKinney Paleontology Scholarship

Jared Voris ‘16

Fred and Barbara Webb Scholarship

Kevin Quillan ‘14

Loren A. Raymond Scholarship

Craig Stewart ‘15

Lloyd L. Hobbs Scholarship

Alex Beck ‘15

Student Presentations, Awards & Scholarships

2014 Student Awards

Promising New Major Award

Hugh Harper ‘15, Laura Heinen ‘16, Devin Hoffman ‘17, Hannah Krueger ‘17

Outstanding Field Student

Kevin Quillan ‘14

Quantitative Geoscience Award

Daniel Gaspari ‘14

Mineralogy Award

Travis Hartney ‘16

Academic Achievement Award

Daniel Gaspari ‘14

Outstanding Senior Geology Major Award

Anthony Frushour ‘14

Undergraduate Research Profile

An interview with Kelli Straka '15



Kelli's field set up along Boone Creek.

Hydropaleontology: Coprolites and Stream Salinity

How did you get interested in the research projects that you have worked on?

I started working with Dr. Heckert after taking Evolution of the Earth lab with him in spring 2013. I had just switched my major from journalism and wasn't sure which facet of geology interested me most—so I decided to start looking. At that point, I didn't know many professors in the geology department that well, and since I knew Dr. Heckert fairly well after taking his lab, I thought doing some research with him was a good place to start. My research on Boone Creek happened a year later after I developed an interest in hydrogeology. I went to Dr. Anderson to see if there was a project I could work on and found out that the current research student was graduating. I have been observing stream temperature and salinity.

Tell us a little about your research experience.

The research I am working on with Dr. Heckert focuses on late Triassic coprolites with scale, bone, and tooth fragments. These coprolites suggest the diets and digestive efficiency of the perpetrators. The coprolites are from the Blue Hills, a strip of badlands, in Arizona. For this project, we submitted an abstract for Southeast Geological Society of America this spring. Currently, I am taking pictures of the coprolites with a 3D microscope for my oral presentation at SEGSA.

The research I am working on in Boone Creek has also been very exciting for me, especially now that it's winter and the use of road salt has increased. Currently, there are 22 temperature loggers and 3 electrical conductivity loggers. The temperature loggers collect temperature readings every 15 minutes. These data have shown that stream temperature increases during rain events as a result of an increase of impervious surfaces which retain heat and increase the temperature of the runoff water. The salinity of Boone Creek is also recorded every 15 minutes and spikes during winter precipitation events. Over time, the salinity of the stream is increasing, even during the summer months, which suggests the salt is being supplied on a steady basis through baseflow.

Where has your research taken you?

This past summer, I went to Arizona and New Mexico with 7 other students and Dr. Heckert on his Triassic Trip summer course. The trip focused on finding fossil sites, digging for fossils, preparing fossils, and displaying fossils. I have also visited the former Virginia Solite Company quarry where a few of us went to look for fossils with members from the Virginia Museum of Natural History. My hydrogeology research has only taken me from the Agricultural Center to Durham Park in Boone, but for both projects, I will go to Chattanooga, TN for the SEGSA spring conference this March.

Does this experience help to push you in a continued or divergent direction?

My research with fossils is not something I intend to pursue as a career. I love picking through fossils and traveling to different sites in search of fossils, but I don't think I'll become a paleontologist—just continue to be a fossil enthusiast. Working in Boone Creek has definitely encouraged me to pursue hydrogeology. It's driven me to want to know and learn more about water systems and the physical and geochemical processes involved with them.

What skills have you gained that you did not get from the classroom?

My research with coprolites has given me a lot of paleontological experience that I would have not gained otherwise. Through the project, I have been able to work with the 3D scope and improved my ability to recognize microfossils. Working in Boone Creek has given me the opportunity to work with programs used by hydrogeologists such as MATLAB, HoboWare, and WinSitu, and experience working in the field. Overall, both projects have provided me with experience of posing a research question, conducting research to answer the question, and later, presenting my findings to other geologists.

Do you have plans to go to graduate school and if you had to guess, what kind of work would you like to do?

I do have plans to attend graduate school. I have applied to the University of Kansas, Syracuse University, and the University of Maine, where I intend to study hydrogeology, specifically groundwater-surface water interactions.

Modes of Dome Formation in the Southern Appalachians

How did you get interested in the research projects that you have worked on?

Structural Geology quickly became my favorite geology course during the Fall of 2013. I wanted to learn more outside of the classroom and realized that research was my best option. My professor, Dr. Casale, invited me to participate with him, Dr. Levine and another student, Taylor Craig, to study two domal features in the Southern Appalachians.

Tell us a little about your research experience.

My research experience has given me a chance to actively participate in the scientific method. My participation has also allowed me to learn and practice many techniques used in investigating structural features. My most extensive work consisted of three weeks in the field over the summer of 2014 where I collected structural measurements and samples. Upon return from the field, I have focused on the Tallulah Falls Dome which is located northwest of the terrane bounding Brevard Fault and is associated with rocks of the Eastern Blue Ridge thrust sheet. I have worked on synthesizing existing published and unpublished maps of the Tallulah Falls Dome region along with our own field data. From the creation of these maps we are able to explore spatial relationships and structural trends, and construct cross sections to investigate the overall geometry.

Where has your research taken you?

My research has taken me out into the mountains of Northern Georgia, and will take me to the SE GSA 2015 meeting in Chattanooga where I will present my conclusions pertaining to the geometry of the domes and the kinematics associated with formation.

Does this experience help to push you in a continued or divergent direction?

The active learning and participation with professors has pushed me in a continued direction. I still find the process exciting and look forward to presenting my work at Southeast GSA.

What skills have you gained that you did not get from the classroom?

During my field work last summer, I was placed in the position of leadership and led a group of my peers for three weeks. This leadership opportunity would never have happened if I was not a part of the research team. I've also learned several programs such as ArcGIS and Midland Valley Move that I would not have been motivated to learn without being a part of the research team. Most importantly my research experience has taught me that science requires flexibility and the ability to approach a problem from several directions in order to learn. I will carry these skills with me as I progress to graduate school.

Do you have plans to go to graduate school and if you had to guess, what kind of work would you like to do?

I wish to continue studying domal features, namely core complexes, after graduation and am currently applying to a couple graduate schools across the country including California State University Northridge and Colorado State University in Fort Collins.

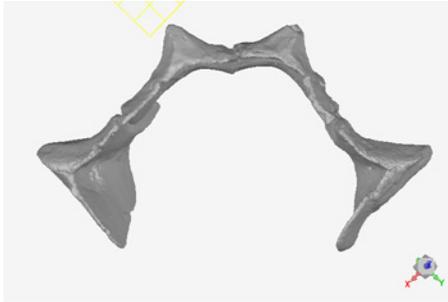
Undergraduate
Research Profile
continued...

An interview with
Craig Stewart '15



Craig in his field area in the mountains of northern Georgia.

An interview with Devin Hoffman '17



View of the cervical ring armor of an aetosaur from North Carolina (Heckert et al., 2015). Devin '17 3D scanned the image in Raleigh at the NC Museum of Natural Sciences.

Microstructure of Triassic Teeth

How did you get interested in the research projects that you have worked on?

I've always wanted to study paleontology and have had an interest in the Triassic Period particularly. The specific projects I've worked on were suggested by Dr. Heckert based on this as well as for the new skills I learned from conducting the research.

Tell us a little about your research experience.

I started research the first semester of my freshman year. I first assisted Dr. Heckert in finishing a project he had worked on over the summer before starting my own project on phytosaurs. Phytosaurs are an extinct group of reptiles from the Late Triassic which resemble crocodiles. Specifically, the project focuses on the tooth enamel microstructure of phytosaurs and looking for any phylogenetic signal in the microstructure. There was a learning curve to actually doing research and the methods I needed to use, but I have enjoyed it.

Where has your research taken you?

My research has taken me to Southeast GSA (Blacksburg, VA) and the North Carolina Museum of Natural Sciences (Raleigh, NC). Field work related to my work include the "Triassic Trip" with ASU to Arizona and New Mexico and work in southern Utah with the NC Museum of Natural Sciences.

Does this experience help to push you in a continued or divergent direction?

In a continued direction, it has introduced me into the career which I have wanted to enter since I was a kid.

What skills have you gained that you did not get from the classroom?

I learned how to: make molds and casts of fossils, use a SEM, create and edit 3D scans, and use a 3D printer. Skills I learned before being taught them in class include writing abstracts and grant proposals, giving professional talks, and how to conduct research.

Do you have plans to go to graduate school and if you had to guess, what kind of work would you like to do?

I do plan to go to graduate school for paleontology. I would like to continue working in the Triassic, early dinosaur evolution has been a topic that I've wanted to research and there are plenty of other discoveries to make in the Triassic.



Devin '17 (second from left) at a field site in Utah for the NC Museum of Natural Sciences with fellow paleontology majors Jared Voris '16 (left) and Haviv Avrahami '16 (right).

Fault Slip Rates in the Los Angeles Basin

How did you get interested in the research projects that you have worked on?

Since I've been a geology major, I've been more interested in the quantitative aspects of the science. I was introduced to Dr. Marshall after taking GLY 1101, and I've been working with him since then.

Tell us a little about your research experience.

We are mechanically-modeling faults in the Los Angeles basin. The Los Angeles subsurface is home to numerous faults capable of generating significant and damaging earthquakes (e.g. Northridge, 1994; Whittier Narrows, 1987). Since many of these faults are blind, field work alone has not characterized all of the active faults in the region. Furthermore, due to complex fault geometries, field-based slip estimates may be non-characteristic of overall fault slip rate. The mechanical models are intended to place more accurate slip-rate constraints and assess potential hazard on the faults in the Los Angeles region.

Where has your research taken you?

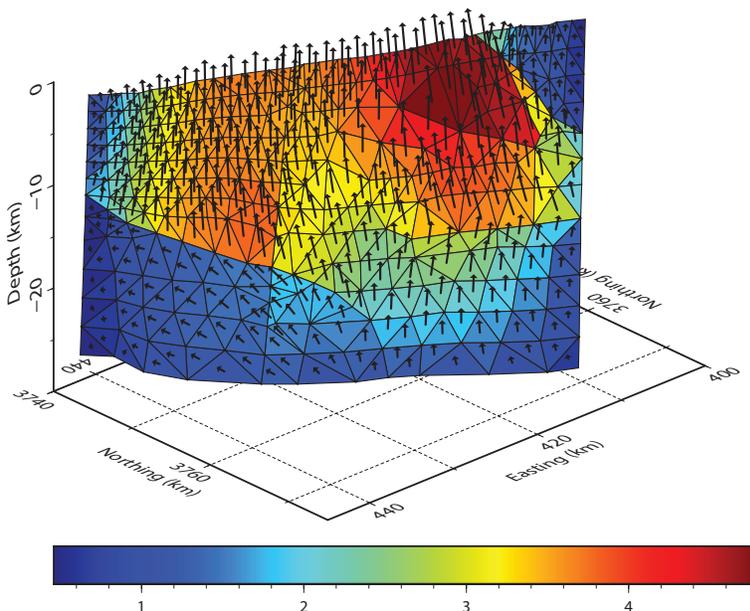
The research we do does not involve field work (on our part, at least), so I spend a lot of my time behind a computer screen (I enjoy it!). Last semester we went to San Francisco to present at the AGU Fall Meeting which was an invaluable opportunity and something of an eye-opening experience. I think it's easy to get into the mindset that science is some static entity (probably an unfortunate side-effect of routine and memorization, which themselves are important), so it's nice to see just how alive geology is today and what an exciting time it is for earth science.

Does this experience help to push you in a continued or divergent direction?

Definitely continued. Each semester of research, I become more excited about the work we do. As I get more involved, I get exponentially more enthused about the research. While what I study specifically will change in the future, the experience I've been afforded has made me sure that I want to continue.

What skills have you gained that you did not get from the classroom?

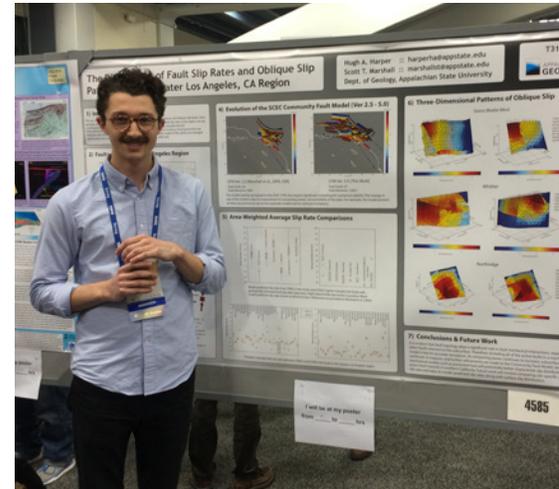
Before I could begin research with Dr. Marshall, I had to become familiar with the tools he uses. I spent a considerable amount of time learning programming languages and programming environments (and am certainly still in the learning process). In addition to that, I took an independent study course to learn the mathematics involved in the research.



Numerical model of the long-term net slip rate along the Whittier fault in southern California.

Undergraduate Research Profile continued...

An interview with Hugh Harper '15



Hugh at AGU.

Do you have plans to go to graduate school and if you had to guess, what kind of work would you like to do?

I just recently finished sending out applications for graduate schools. I would like to continue conducting research in geophysics, but the programs I have applied to are diverse. Some of the prospects are: mantle tomography, deep crustal seismology, geodynamics, and geodesy; I'm not sure where I'll end up, but I know I will be very happy regardless.

Alumni Profile

An interview with Jon Mitchell '10

Appalachian Geology Lays Foundation for Later Success

Where has your Earth science career taken you since leaving ASU?

I'm now a 5th year Ph.D. candidate at the University of Chicago studying how ecosystems have changed through deep time. I am in the process of looking for a job to continue on as a researcher and hopefully professor.

Relative to your peers, how well do you feel that ASU prepared you for graduate school?

The ASU Geology Department had a heavy emphasis on field studies and practical, hands-on identification skills. These skills have served me incredibly well since I graduated, as I've traveled to do fieldwork, attended meetings, and taught undergrads. Even though I'm in a Biology department now, my office is in the Geology building, and my training at App State lets me participate in everything from geology journal clubs to helping teach geology courses.

What originally made you decide to major in geology?

The opportunity to do research, even as an undergraduate.

What was your most valuable or most memorable experience as an undergraduate geology major at ASU and how did it help to shape your future?

Either when Dr. Heckert pulled out a plastic jar filled with sediment and asked for volunteers to find fossils in it, or going out on the "Triassic Trip" to New Mexico & Arizona. Both helped solidify my desire to research paleoecology, and the work I did at App State helped me master skills that I use constantly even now.

Do you have any advice for current ASU geology students?

Get involved! ASU's geology department has more opportunities to do research as an undergrad than just about anywhere else, and getting your feet wet now will help you in any career you decide to pursue!



John Mitchell '10 in the field in Patagonia, Argentina.

Geophysics with KU and Chevron

What originally made you decide to major in geology?

Before coming back to ASU to get a second undergraduate degree, I worked in Wyoming near the oil fields. I was exposed to a lot of amazing geology there and I was able to learn a little about it by working closely with the industry. I became really interested in geology and geophysics at that point and decided to pursue it as a career.

Where has your Earth science career taken you since leaving ASU?

After leaving ASU, I attended the Summer of Applied Geophysical Experience (SAGE) in Santa Fe before entering graduate school at the University of Kansas. At SAGE I learned the physical principles behind many different geophysical methods such as Vibroseis, electrical and gravity methods. I also got to collect and process data using those methods. Participating in SAGE gave me more geophysical experience that I would not have had before beginning my graduate work.

At KU I majored in Geophysics within the Geology department. I got a Graduate Research Assistant position at the Kansas Geological Survey in the Seismic Exploration Services Unit. This provided me a unique opportunity to see, help collect, and process many different kinds of real-world data from all over the U.S. I also completed a thesis entitled 'High-resolution shear-wave reflection profiling to image offset in unconsolidated near-surface sediments' in which horizontally polarized shear wave reflection data was used in the near surface for site-characterization along a man-made dam in a high-risk seismic zone adjacent to a large active fault.

I also completed two summer internships with Chevron performing delay-time analysis and tomography and developing a workflow for Reverse Time Migration (RTM).

After KU, I accepted a full time job with Chevron. My first assignment was with the Velocity Modeling Team with the Chevron Energy Technology Company. I get to see and work with data from all over the world. In less than a year I've worked with data from Africa, South America, the Middle East and Asia. I will go through a five year training program where I will take classes that develop my skills and rotate through three assignments in different units to enable me to decide what direction I want to take. I still participate in conferences and professional organizations and currently serve as Treasurer of the Association for Women Geoscientists (AWG), which is a national organization encompassing the entire spectrum of geoscience careers and is devoted to enhancing the quality and level of participation of women in geosciences and to introduce girls and young women to geoscience careers.

Relative to your peers, how well do you feel that ASU prepared you for graduate school?

My time at ASU prepared me extremely well for graduate school. It provided me a solid foundation of class work, field work, technical writing, and research skills. The hands on experience that students get at ASU on field trips is something a lot of other students will only ever see in a book or in a hand sample. Being able to look at so many different types of geologic environments and structures over the course of four years is not something everyone gets to experience. It gives ASU students a little something extra. I was a little different at ASU because I wanted to pursue geophysics. Even though this wasn't something that was typical I was still encouraged to write a thesis with a geophysical focus and the department was able to purchase some geophysical equipment. I was able to learn how to collect, process, and interpret my own geophysical data, even if only on a small scale. Going into graduate school, that experience alone allowed me to hit the ground running compared to my colleagues, who were also going into geophysics but coming from a geological background.

Alumni Profile
continued...

An interview with Bevin Bailey '11

What was your most valuable or most memorable experience as an undergraduate geology major at ASU and how did it help to shape your future??

I consider being able to collect my own data, write and defend an undergraduate thesis to be the most valuable experience during my undergrad. It really helped to prepare me for balancing classwork, thesis research and a research assistantship during graduate school. Having already done my own research and written a thesis really helped me to know what to expect and to better understand what was expected from me during graduate school. That experience helped me get into the SAGE course and was a valuable addition to my resume.

Do you have any advice for current ASU Geology students?

One piece of advice for current ASU geology students would be to get involved with as much as you can during your undergrad. Participate in research, field work, conferences and professional societies as much as you can. Consider writing an undergraduate thesis, especially if you plan on attending graduate school. Another piece of advice would be to keep an open mind about job opportunities in the Geoscience field. There are many great opportunities in the academic, government, oil and gas, mining, environmental, National Labs, and engineering branches of geoscience.

Faculty Research Profile

Dr. Heckert goes to Argentina on an OCSA

Heckert Goes to Argentina

This fall I was able to enjoy my first OCSA (Off Campus Scholarly Assignment, or “sabbatical”), a release from teaching and service obligations to focus on research and my career development. My trip had several components—I studied specimens in museums, went in the field, and attended the International Palaeontological Congress (IPC) in Mendoza. My principal collaborator in Argentina is Dr. Julia Desojo of the Museo Argentino de Ciencias Naturales.

I traveled to Buenos Aires, San Juan, and Tucuman to study in museums, visiting a world-class museum in La Plata as well. In the museums I focused primarily on fossils of aetosaurs—heavily armored Late Triassic reptiles that one can think of as a bizarre hybrid of an armadillo and a primitive crocodile. Right now I am putting the finishing touches on one manuscript and am about halfway through another paper on the growth of their armor.

The field work component was a two-week trip where I was the only North American in Dr. Desojo’s crew prospecting and collecting in the Middle Triassic Chañares Formation in Talampaya National Park. The Chañares is world famous—vertebrate paleontology legend A.S. Romer and his crews made many spectacular discoveries here in the 1960s, and in many ways this trip was the most amazing collecting trip I have ever been part of. Although my job was to try to find microvertebrates and that did not work out great, I was able to field test some new screenwashing techniques and improve the yield of small specimens they collected.

Finally, I also attended the IPC in Mendoza, including going on both mid-meeting and post-meeting field trips to Triassic rocks. I greatly enjoyed the meeting, co-authoring one poster presentation on aetosaurs with Dr. Desojo and her student and giving a talk on microvertebrates. The field trips were outstanding, not just to see Triassic rocks with the experts that worked on them, but also to network and forge new possibilities for collaboration in the future. I also took an extra day in Mendoza to tour into the Andes Mountains, catching a glimpse of Aconcagua, the highest peak in the southern hemisphere. The road, which connects Argentina to Chile (along a route Darwin traveled ~180 years ago) included some of the most spectacular geology I have ever seen.



Andy in the Cuyana Basin in Argentina (photo courtesy of C. Badgely).



Andy pulling on a jacket.



Andy in the field with his Argentinian field crew.

Italy Field Camp - Take 1

The 2014 Appalachian State University Field Camp in Italy marks a return to mapping in Italy after a hiatus of more than 10 years. Gabe Casale and Jamie Levine took 15 students to the Northern Apennines for 6 weeks to map in dominantly carbonate rocks that straddle the K-T boundary. Students completed 3 mapping projects that increased in complexity from contractional to extensional structures, and finally to rocks metamorphosed to greenschist facies. While mapping, App State students lived in small Italian villages with either other American students (from Penn State University) or Italian students (from the University of Perugia).

The highlight of the trip was certainly the 10 days students spent living and mapping with their Italian colleagues. Italian students taught App State students Italian words, and the American students tried to teach the Italians how to play Ultimate Frisbee. In the end, soccer was determined to be a more universal sport! Side trips to Perugia, Pisa, and Orvieto gave students time for caffè and gelato, art museums, and some much-needed time away from rocks. The last mapping project took place in the visually stunning Alpi Apuane, in northern Tuscany, where we stayed in a converted monastery, ate wild boar fattened on chestnuts and freshly caught by our host, and mapped around active mines famous as the source of marble for the David, Pieta, and other renaissance masterpieces. Here, Gabe and Jamie had to prove their mettle driving manual transmission 9-passenger vans on “apparently” 2-lane roads, sometimes listening to a van full of students singing 80s hits at top volume!

All and all, it was a wonderful cultural adventure, full of hilarious memories! We have some exciting updates for this next year: we have included a new project on the infamous island of Elba, and a visit to Boone by our colleague from the University of Perugia to plan possible future student exchange opportunities. Stay tuned!

Field Course Update

Summer Field Geology in Italy



Daniel Gaspari '14 in front of an outcrop of the famous Carrara Marble.



ASU field camp students visit the KT boundary.



Chris Bagley '14 mapping.



ASU students with their Italian counterparts from the University of Perugia.

Appalachian Geology in Iceland

Field Course continued...

Environmental Geology Field Course in Iceland



On the Laugavegur Trail.

This past July, Appalachian Geology offered a summer field course in Iceland for the first time. The course was led by geology department faculty members Brian Zimmer and Scott Marshall. Fourteen students participated in the inaugural trip that included 16 days exploring an array of different geological features and sites of cultural significance along Iceland's southern coast and volcanic interior. The first 8 days were spent traveling by bus to various sites along the southern Ring Road and camping at developed campgrounds. During this time, students explored lava tubes, toured a geothermal power plant, climbed cinder cones, and learned all about the dynamic and often fickle Icelandic weather that kept us soaked the first 3 days. Despite the initially wet weather, the students' spirits were not dampened and as the weather cleared, the trip really took off. We spent a day on the island of Heimaey, where in 1973, the Eldfell cinder cone was born, burying one-third of the town beneath lava. Students had the opportunity to visit the newly-opened Eldheimar Museum, the site of a modern excavation of several houses buried during the 1973 eruption. Iceland is also well known to geologists for its spectacular active glacial processes. While visiting Vatnajökull, Europe's largest glacier, students went on a three hour trek on the glacier and took a boat into Jökulsárlón, a picturesque glacial lagoon filled with icebergs. While there was no doubt a bit of geotourism, the course was also very academically engaging. Students were responsible for writing one chapter of a field guide and leading discussions at field trip stops related to their topics.

After 8 days, the bus dropped us off at Landmannalaugar inside the Fjallabak Nature Reserve in the central volcanic highlands. For the next five days, we backpacked south along the Laugavegur Trail, traversing the geothermically active Torfajökull caldera before dropping into the verdant Álftavatn rift valley. The Álftavatn valley is home to many sub-glacial volcanic ridges, dozens of mafic volcanic edifices and a huge glacial sandar. Students saw the raw beauty of Iceland's wilderness, but also its fragility. Certain sites showed significant degradation from careless tourism. It is a lesson that students bring home to Boone as we, as a community, try to balance tourism with conservation. As the group continued south on the Laugavegur Trail, we battled blisters, snow, glacial river crossings, and a windstorm that obliterated one of our group's tents. On day 5, we reached the Þórsmörk valley at the base of Eyjafjallajökull, the ill-tempered volcano that shut down air-traffic throughout Western Europe for several weeks in 2010. A small group climbed to the Fimmvörðuháls pass where the lava falls and new cinder cones from the 2010 eruption were still steaming. From Þórsmörk the group made its way to Reykjavik where a pleasant group dinner of rancid shark meat and dried fish nicely wrapped up what was an extremely successful first expedition to Iceland. The course is set to run again during the summer of 2015 and enrollment has already begun to fill.



Andrew Burgess making his presentation about calving at Jökulsárlón.



Students of the inaugural GLY 1103 Iceland course on Vatnajökull.

Southwest US

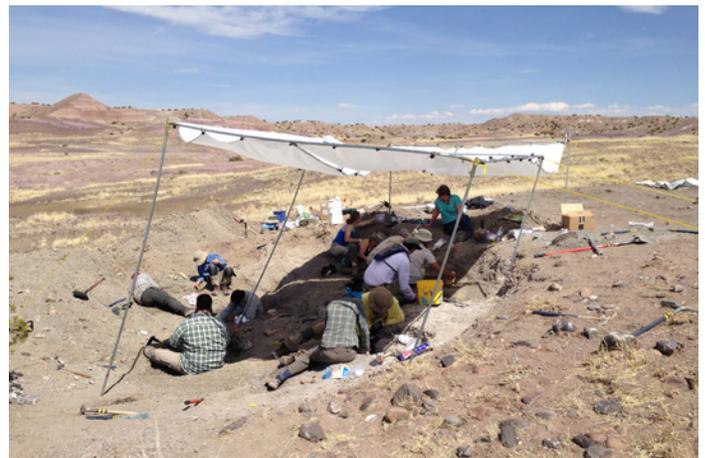
Dr. Heckert is currently planning the itinerary for the 2015 Triassic trip, which will be the 10th overall and 9th offered as a class in the department. The 2014 trip built on the successes of past trips, collecting many fossils from the Placerias quarry in Arizona in conjunction with the North Carolina Museum of Natural Sciences. For the first time, the trip also spent several days in the Zuni Mountains of New Mexico exploring and re-collecting Triassic sites that were part of Heckert's master's thesis area. Annual visits to the Petrified Forest National Park and the "all-access pass" behind the scenes of the New Mexico Museum of Natural History remain on the itinerary, and a budding collaboration with paleontologists at Virginia Tech is in the works.

Field Course
continued...

May Triassic trip to the
Southwest US



Pictures from the 2014 Triassic Trip.



Outreach

Webb Rock Garden & McKinney Museum

Rock Garden Update

The Fred Webb Jr. Outdoor Geology Laboratory (“Rock Garden”) continues to grow. Last Spring Dr. Andy Heckert purchased several slabs of Upper Ordovician fossiliferous limestone from Butler County, Ohio, so there are now macroscopic fossils on display. The Rock Garden and surrounding areas now holds 38 specimens (the original plan was only for 20!) and is a focal point for events not just in the department, but the campus as well. Most recently, this included a dance performance choreographed by geology major Christine Counts. Thanks again to Vulcan Materials Company and all of our other sponsors for helping us make a facility unlike any other in the region.

To see more on the rock garden, check it out on the web at:
<http://mckinneymuseum.appstate.edu/rock-garden>



McKinney Museum Update

The F.K. and M.J. McKinney Geology Teaching Museum continues to honor its namesake by providing exhibits and outreach in geology and paleontology to all audiences. Recent donations of Cretaceous vertebrate fossils by Walter W. “Bill” Stein '94 will be on display soon, and the “Answersphere” students continue to help tutor introductory students. The museum remains popular with school groups, especially those from Wilkes County, and is a focus of much activity as part of every year’s North Carolina Science Festival. In the past few years we’ve started taking our outreach “on the road” to fossil fairs, going to the Schiele Museum in Gastonia, the North Carolina Museum of Natural Sciences in Raleigh, and, most recently, the Virginia Museum of Natural History in Martinsville. There our students demonstrate research “in action,” picking for microvertebrate fossils while showing off a variety of fossils and casts as well as videos highlighting Appalachian geology students in the field.

To visit the museum virtually, click on:
<http://mckinneymuseum.appstate.edu/>

If you know you are going to be in town, please let us know and we can show you around.



An overhead view of the Fred Webb, Jr., Rock Garden, which just received its 37th specimen.

Fossil Fairs

A dedicated corps of Appalachian Geology students have been helping Dr. Heckert with outreach by manning tables at regional museums during “Fossil Fairs.” These students give up a significant chunk of their weekend to set up a booth with a variety of fossils, casts, and molds, answering questions from the public and serving as ambassadors for the department and the school. Where the Appalachian Geology table is unique is that the “Finding Fossils on Friday” crew spends part of the time looking for microvertebrates in fossil matrix--- showing off “science in action” as students search for Triassic fossils. These events are hugely popular, with the Fossil Fair at the North Carolina Museum of Natural Sciences bringing in over 5000 visitors and another at the Virginia Museum of Natural History 1400 visitors of all ages. The next chance to see the group on the road is at the Schiele Museum in Gastonia on February 28.

Outreach
continued...

Fossil Fairs



Geology students at the Raleigh Fossil Fair.



Geology students at the Raleigh Fossil Fair.

Faculty & Staff Notes

Bill Anderson
Sarah Carmichael
Lauri Miller



Bill at his latest field site, Llanlliana, on the island of Anglesey in Wales.



Sarah with Johnny Waters and Cameron Batchelor '15 in Mongolia.

Bill Anderson, Professor & Chair

I have continued to work on hydrogeology research amidst my duties as department chair, and 2014 was a productive year for me. My work in the UK with colleague Roland Gehrels of the University of York continued during the summer, when we visited several new field sites in southwest Wales and on the island of Anglesey in northwest Wales. Like my previous research in Devon, England, which was published in November in *Marine Geology*, this new work involves determining paleo sea levels based on groundwater conditions in freshwater marsh/gravel barrier systems, but because the field sites lie closer to the glacial limit, they involve different rebound conditions. I am co-advising a York Ph.D. student in this project. My work in Boone Creek continues to involve students. Kelli Straka '15 took over the massive temperature data collection project in May and started a new focus on contamination from road salt by monitoring electrical conductivity at four sites. She will present her findings at Southeast GSA in Chattanooga, TN. Another student, Alex Beck '15, will defend a thesis in May that is quantifying baseflow heterogeneity, again using a field site in Boone Creek. Both of these students received multiple grants from the ASU Office of Student Research. Sonia Sanchez-Lohff '14 completed a senior thesis that continued my previous work with former ASU Geology colleague Ryan Emanuel on interannual climate oscillations and their influence on the characteristics of precipitation events in North Carolina. On a final research note, I wrote a chapter on coastal groundwater for a textbook published by Wiley and AGU entitled *Coastal Environments and Global Change*. I continue to teach the general education course *Water: Mountains to Sea*, which has proven to be quite popular and is offered every semester, as well as *Hydrogeology*. I would love to hear from former students, so please send me an email with an update!

Sarah Carmichael, Assistant Professor

I have had yet another extremely busy year working on a variety of local and international field projects. Once again, I spent my summer circumnavigating the globe two times within three months. In June I traveled to Wuhan, China, and the Three Gorges Dam region with Dr. Johnny Waters where I presented my research on geochemistry of mass extinctions (a UNESCO funded project in collaboration with Dr. Waters) at the 3rd International Geobiology Conference. Dr. Waters and I got back on a plane and returned to Mongolia in August 2014 for three weeks with student Cameron Batchelor '15 for a combination field workshop/conference that took us from Ulaanbaatar to an extremely remote field site in the Gobi Altai on the southwestern China/Mongolia border. Future fieldwork associated with this project will be to return to northwestern China in 2016, Belgium/Germany in September 2015, and northern Vietnam (dates TBD). We now have five students working on this project: Cameron Batchelor '15, Iris Ferris '17, Matthew Wilson '16, Robert Thomas '17, and Casey Weber '18. Cameron, Dr. Waters, and I will be traveling to New York City in March to present our work in Mongolia to the Explorer's Club (which funded Cameron's travel to the site). I still continue to work on manganese biomineralization - both in caves with Dr. Suzanna Bräuer in the Biology Department as well as in fault breccias in the southern Appalachians with Geology instructor Crystal Wilson. I teach *Petrology*, *Introduction to Physical Geology*, *Preparation of Geologic Reports*, and an interdisciplinary class with the Appalachian Studies program called the *History of Coal from the Pennsylvanian to the Present*. In October 2014 I won the College of Arts and Sciences William Strickland Outstanding Young Faculty Award for my various research projects which take me to amazing places - both around the world and close to home.

Lauri Miller, Administrative Support Specialist

In June of this year, I will have been the Department of Geology Administrative Assistant for 10 years! I can't believe how much our Department has grown in that time and how truly excellent our program continues to be. Our students are amazing, our faculty is outstanding and the opportunities we offer our majors are not only educational, but thrilling to say the least. I am still excited to be a part of it all, I still love coming to work every day and I am still just as proud of these students as any parent could be! I look forward to hopefully, the next 10 years!!

Gabe Casale, Assistant Professor

Going into my third summer at Appstate I am happy to report that the first round of the Italy field course went off without a hitch and we are doing it again in the summer of 2015! Dr. Levine and I learned a lot about manual transmission vans and the nuances of leading a group of 15 people with as many dietary restrictions for six weeks. Simultaneously, we made some excellent connections and are looking forward to the addition of an excursion to the island of Elba for some beach geology in this year's itinerary. In fact, last year was such a success that we have motivated a visit by our colleague, Francesco Mirabella, from the University of Perugia this spring to explore options for bringing Italian students to Boone. Both Structure (3150) and Intro (1101) are growing, this year we added a second section to Structure to accommodate the 32 student enrollment, and we are bursting at the seams with 135 students in Intro. On the research front, Dr. Levine and I just submitted an NSF tectonics grant proposal to continue our work in Georgia. This is an exciting project and scientifically and I am proud to report has been led in large part by our research students, Taylor Craig, and Craig Stewart; our proposal was a group effort and includes the data and observations that these undergraduate collaborators have accumulated over the summer field season and in the lab over fall semester. We are happy to see Craig graduate this spring, but sad to see him go and leave open a seat for someone else, hint hint.

Ellen Cowan, Professor

As you have already heard the number of students taking upper level Geology courses has grown substantially. For the first time this fall, I taught two geomorphology labs. We traveled to most of the same field trip locations but sometimes under very different weather conditions between Wednesday and Friday afternoons! My Alaska research has moved into the lab this year. Two students, Hugh Harper and Mathew Sandefur, processed over 500 samples this summer from IODP drill core. IRD is abundant in the Gulf of Alaska over the last 3 my. Now we are looking at quartz grains under SEM and petrology of the rock fragments to determine the glacial history and provenance in Alaska. Matt and Hugh are presenting a poster at SE GSA this spring. I am also still working on magnetic detection of coal ash in river systems. Daniel Gaspari successfully defended his honors thesis last summer. The results are promising and we are going to initiate a field project this spring on the Dan River to track coal ash that spilled from the Duke Energy Plant in Eden, NC. At home, Keith is busy working on interesting geoaerchaeology and environmental projects, mostly across the SE. Our daughter, Alison is a freshman at Queens University of Charlotte this year. After visiting a bunch of schools over the past couple of years she picked Queens partly because of a track scholarship and because it was so different from Boone! Mary is a junior in high school. She is playing on the golf team and in tournaments so we have traveled around NC and SC with her. I haven't taken up the game but I find it fun because golf courses are modeled after glacial landforms. So Pinehurst looks like Alaska without the ice. Best wishes to all. I would love to hear from you!

Brian Gibson '11, Lecturer

Hi everyone. I'm still the newest faculty member, but as my fourth semester teaching rolls along I'm feeling more like a veteran. I enjoyed the second round of teaching the Hydrogeology lab. My students were able to tour the University's Water Treatment Facility, and they all enjoyed seeing where their water comes from and learning about the complex system of pumps, chemical treatments, and filters that keep clean drinking water flowing to the fountains. Despite multiple attempts, I'm still unable to get them into the Waste Treatment Facility to fully round out the hydro-experience, which really stinks. Last summer I was guiding brave tourists through Worley's Cave in Tennessee and down whitewater stretches of the French Broad and Watauga Rivers. It was a fantastic overlap of adventure and geology, but this summer I'll be hanging up my helmet and paddle to focus on more academic pursuits. I'm excited to teach my first lecture section this summer for GLY 1103 - Environmental Change, Hazards, and Resources. And as part of a Duke Energy Water Resources grant, I will be helping to put together a curriculum for high school students related to water resources.

Faculty & Staff Notes continued...

Gabe Casale
Ellen Cowan
Brian Gibson



Gabe at an outcrop in Italy during the field camp, Summer '14.



Brian on Seneca Rocks, WV, with his dog Raven.

Faculty & Staff Notes continued...

Jamie Levine
Chuanhui Gu
Brian Zimmer



Jamie at the ASU Field Camp in Poggiodoro, Italy.



Chuanhui enjoying a bit of the High Country.

Jamie Levine, Assistant Professor

This year has gone by in a flash, in large part because of time spent preparing for and then successfully conducting the 2014 Appalachian State field camp in Italy. Gabe Casale and I had a group of 15 lively, enthusiastic students who took it upon themselves to embrace Italian culture and geology. We all succeeded in making Italian friends, and had a series of adventures that will not be soon forgotten! I have continued to teach Evolution of the Earth (E of E) and Preparation of Geologic Reports (Prep) and both classes have gotten quite large, big enough for multiple sections of both courses. Students in both classes are enthusiastic about going out in the field, and despite a spring E of E field trip that transitioned from rain, to hail, to snow, and a Prep overnight field trip that barely cracked 50 degrees in early October, I have been impressed with students' field abilities and their positive attitudes. In the spring Kevin Quillan '14 finished his mapping project on the Fries and Gossan-Lead Faults in the Warrensville, Park, and Jefferson quadrangles, and produced a 1:24,000 scale delivered to the USGS. Also this spring I attended a Penrose conference on "Linkages and Feedbacks in Orogenic Processes," which focused on deformation in the Southern Appalachians, and reminded me how much work there is still to be done in the area! I am currently actively involved on research in the Tallulah Falls Dome, Georgia with Gabe Casale and our two research students; these students will be presenting their findings at the 2015 SE GSA meeting in Chattanooga, TN.

Chuanhui Gu, Assistant Professor

I had a fruitful year of 2014. I continued to enjoy teaching my geochemistry course with a group of motivated students this past fall. This course covers a broad range of topics related to Earth and Environmental Sciences into which I can incorporate my research. My "soil mechanics"-based Advanced Environmental and Engineering Geology class continues to be one of the key courses that prepare students for the workforce in the engineering/environment industries. With respect to research, I was excited to publish my research on the impacts of lawn management on climate change with colleagues from Vanderbilt and UC Boulder. We found that urban lawns actually serve as a big carbon emitter, which contrasts with previous studies that documented lawns storing carbon. Our study was the first to compare carbon sequestration to nitrous oxide and carbon dioxide emissions from lawn care practices. Back at home, I am always passionate about our local waters. The living streams pulse like veins through landscapes. By looking at streams, you can tell whether a landscape is sick. For example, Dr. Anderson and I found stream temperature patterns have been greatly altered by urban development across multiple time scales. I am so proud of Chase Batchelor '14 who published her work on stream hyporheic exchange and nutrient uptake in a peer-reviewed journal Environment and Natural Resources Research. I am still enjoying wading in the local streams along with Laura Heinen '16 to study stream pollutant removal processes. She presented her work to 2014 stream ecology and restoration conference at Charlotte as the only undergraduate. She was not intimidated for sure.

Brian Zimmer, Lecturer

Hello all! Life in my little corner of the geology department continues to be diverse and exciting. This past summer Scott Marshall and I took 14 students to Iceland for the inaugural Land of Fire and Ice geology field course. The trip was a great success and enrollment is looking good for this summer as well. During the academic year, I continue to teach introductory geology lectures and labs and two first-year seminar courses. The first, A Walk in the Woods, teaches students various bushcraft skills (plant identification, bird calls, hide tanning, fire by friction, etc) while reading books from great conservationists like Aldo Leopold and Daniel Quinn. Last spring I taught, for the first time, a first-year seminar called Juggling and the Circus Arts. If you search Appstate Juggling Club on Youtube, you will see some of the students' work. In the realm of research, I continue to work with Cindy Liutkus-Pierce and Sarah Carmichael on the Engare Sero Footprint site in Tanzania and as well as personally looking into sub-glacial volcanic processes at two tinders in Iceland. The Spring Sustainability Film Series that I organize is already in its 6th year and we have a strong array of films set for this spring. We screen films on all topics of sustainability for the greater Boone community and host discussion panels after the films.

Steve Hageman, Professor

Much of my energy in the past year has gone into the transition of the Journal of Paleontology from an enterprise that was independently published by the Paleontological Society to a publishing partnership with Cambridge University Press. This has been quite an undertaking but I feel very good about how this sets the Society's journals up for scientific publishing in the 21st Century. The transition is still underway, but our new portal with Cambridge is at Journal of Paleontology.

I have spent most of my time working in Boone, but I was able to spend some time in Scotland last summer with my wife, Liz, when I gave an invited talk in the Department of Biology at St. Andrews University.

My research on the Ediacaran–Cambrian transitional faunas of the southern Appalachians (Chilhowee Gp.) continues and I have two manuscripts in revision/prep. with William Miller III (Appalachian alumni). William plans to spend some time in residence in the Department next Fall during his sabbatical. We are both looking forward to spending time in the field in the southern Appalachians with our newly developed perspectives of early Cambrian trace fossils and their significance for unraveling events that lead up to the Cambrian Explosion (link to GSA abstract).

Andy Heckert, Professor

The past few years have been productive for me. I now teach our general education Historical Geology course regularly, and am developing a new course for general education called "Dinosaurs: Then and Now." My research on Triassic vertebrates continues to go well—soon we will publish a new aetosaur from North Carolina in the Journal of Vertebrate Paleontology and I just wrapped up a three-year project involving Triassic rocks in Dinosaur National Monument. As part of this project I was able to hire students to help me both in the field there and in the lab here. I have an outstanding group of students, including several paleontology concentrators, involved in microvertebrate research projects. My FFF ("Finding Fossils on Fridays") will have multiple presentations at SE GSA this spring and, hopefully, the Society of Vertebrate Paleontology meeting this fall. I also just received internal funding to develop a more scientific, indoor screenwashing apparatus (no more screenwashing in Boone Creek) that will keep me and my students busy. This Spring I will lead the 10th (!) "Triassic trip," returning again to New Mexico and Arizona in search of Triassic tetrapods.

Lauren Waterworth '01, Lecturer

Hello Fellow Alumni! It's been a big year. I had a baby in July 2014, Viviane Brook, and she is pretty amazing. She can't yet wield a rock hammer, but we are working on it. I was out on maternity leave for a good part of the year but am back this semester teaching the 1103 Intro Environmental Geology labs. My legal work in Kentucky has picked back up with the issuance of two very strongly worded rulings from the Franklin Circuit Court in a case against a company that violated its mining permits by submitting false water monitoring reports. First, the court ruled that the state's enforcement of the Clean Water Act against the company was not adequate or reasonable. Then it ruled that the state agency violated our clients' due process rights by proceeding with its enforcement without providing adequate or meaningful opportunities for citizen participation. In the meantime, we discovered that this company resumed its shenanigans and submitted hundreds more false reports in early 2014. This discovery further underscores that the state's original enforcement was not adequate. Our team's work has been picked up by many news outlets, including the New York Times. Stay tuned!

Faculty & Staff Notes continued...

Steve Hageman Andrew Heckert Lauren Waterworth



Steve Hageman



Andy posing with a Zupaysaurus in Argentina, Fall '14.



Viviane Brook Waterworth '36.

Faculty & Staff Notes continued...

Johnny Waters Anthony Love



Johnny Waters (top left) and research colleagues in Mongolia, Summer 2014.

Johnny Waters, Professor

2014 was an excellent year in my post-chair career. I have two lines of research going - 3D visualization of the internal organ systems of fossil echinoderms, and ongoing studies of anoxia and mass extinction, with fieldwork concentrated in Asia. These lines of research met (collided) with fieldtrips to China and Mongolia with Dr. Sarah Carmichael. In Mongolia we were joined by Cameron Batchelor (BS'16) and 20 of our closest friends (from 10 countries) for extended fieldwork in the Upper Devonian in the southwestern part of the country along the Chinese border. At the complete opposite end of the spectrum, I did lab work at the Swiss Light Source Synchrotron outside Zurich over Spring Break. Teaching went well and I was named the Honors College Teacher of the Year for 2014. 2015 is off to a good start with papers accepted, grants funded and new adventures planned. Sarah Carmichael and I are taking Cameron to the Explorer's Club annual dinner in New York in March (where Cameron is making a presentation as an EC grantee). I am taking two students to an echinoderm field conference in Spain in June and pursuing an option to do fieldwork in Iran in May.

Anthony Love '99, Research Operations Manager

Greetings from the correspondence desk and lab!

2014 marks 20 years of being in Boone, 19 years of being in the Department of Geology (4 as a student and 15 on the professional staff). Through my experience, I have come to appreciate that each of our faculty study interesting things, however my mind continues drawn to the rocks from space. This continued interest was good to me once again this past year. In the past year I have published data on 20 new meteorites from the hot deserts around Morocco, presented at last years Lunar and Planetary Science Conference in Houston, and taught a course titled Introduction to Meteoritics and Cosmochemistry (which is being taught again this Spring). Because of my interest in meteorites and in part due to luck, a number of extremely rare meteorite samples (samples of the Chelyabinsk meteorite, a Martian, and a Lunar meteorite) and thin sections were recently donated to the Department by one of the generous members of our College of Arts and Sciences Advisory council, Mr. Don Cline. These samples continue to be of great benefit to teaching, and our outreach efforts. Additionally, I have spoken to at least 4 individuals claiming to have found meteorites, although these proved to be rocks local to back yards or xenoliths placed (possibly by aliens!). From my experience, the best places to find meteorites are still the hot deserts on the African continent, the cold deserts of Antarctica and EBAY! Due to the efforts of our web guru, Dr. Sarah Carmichael, we continue to be a world-wide source of information on geology. Since the last newsletter, we have received and responded to questions from individuals in Vietnam, Korea, Malaysia, England and drumroll please. . . . Vanuatu! Typically, many people are interested in rocks they found, however, more frequently, we are receiving questions about fracking and its associated hazards. We still receive our share of headscratchers ranging from folks who want to know whether the faces they see on rocks are natural or coincidence, to folks (there have been more than 3) who seek the consult of geologists who are uncorrupted by silly ideas like plate tectonics. I continue to work on developing the proper response to these types of emails. This spring I have some some outreach opportunities that will take me away from the computer and into the outdoors to talk with the public about the geology of Chimney Rock State Park and Grandfather Mountain State Parks. I am also looking forward to seeing Big Bend National Park with my family this spring.

Hope you all are well and if you find a meteorite, remember to send it here first!

Cindy Liutkus-Pierce, Associate Professor

It's been a busy year since the last newsletter, but all continues to go well in my corner of the world. My research continues in East Africa, and during the annual GSA conference in Vancouver, British Columbia my former MSc advisor (Gail Ashley) and I chaired a topical session on reconstructing hominid paleoenvironments. It was hugely successful, populating a half-day session of talks and an afternoon poster session, and my undergraduate research student, Oliver Burns, presented our poster on Miocene primate paleoecology in western Kenya. I'm proposing to chair a similar session at the upcoming Baltimore GSA conference, so keep an eye out for me if you're going to be there, and please stop by to say hello. Bigger and better seems to be an ongoing theme in my courses—both SedStrat (GLY3800) and E of E (GLY2250) continue to grow, and as they do it's always fun to come up with new, challenging field trips and exercises to do with such a large, diverse group. Gone are the days of taking a handful of Sed/Strat students to the Outer Banks for a weekend field trip, but instead we are visiting “beaches” much closer to home (in the Cambro-Ordovician rocks of southwestern Virginia). I am no longer the Faculty Advisor for the Geology Club, having passed the torch to Dr. Jamie Levine, and am instead focusing my time on various other committees on campus at various levels. My husband and I are painfully close to finishing our new house, and we hope to be moved in before the end of the semester—just in time to enjoy Spring in the Appalachians from our back deck! I always enjoy hearing from former students and alums, so keep those emails/notes coming.

Scott Marshall, Associate Professor

The past few years have been challenging, but exciting for me. Since arriving at Appalachian State University in 2008, I have expanded my fault mechanics research into the cutting edge field of satellite geodesy. I now process GPS and InSAR satellite data that can measure mm-scale motions of the surface of the Earth. Much of my work has been funded by the Southern California Earthquake Center (SCEC). In recognition of my work on the complex faults of the Transverse Ranges in southern California, I have been named as one of the leaders of the SCEC Ventura Special Fault Study Area (SFSA). Recent work has suggests that this fault system has created several \sim M8 earthquakes in the past, so the SFSA's goal is to fund work that will help to better constrain the seismic hazards of this complex system.

I am currently working with three geology students: Hugh Harper is modeling faults in the Los Angeles region using the recently updated SCEC Community Fault Model. His models predict the long term motions on every fault in the region and so far, match geologic rates well. Hugh presented this work at the fall meeting of the American Geophysical Union in December of 2014. Hannah Krueger is analyzing GPS time series data to determine if seasonal deformation patters can be correlated to rainfall in the Los Angeles region. Adam Esker is using electrical resistivity surveying to characterize the subsurface of a local floodplain of the New River. He is working to determine how the electrical properties of his site change with time, season, and groundwater levels.

On the teaching front, I have been taking my geophysics class into the field and training students to collect and interpret Ground-Penetrating Radar (GPR), seismic refraction, and direct current electrical resistivity data for 6 years. I have also recently created a MATLAB-based quantitative data analysis course to better prepare students for the more quantitative aspects of geoscience research. My goal in teaching is to train students in modern skills that are valued by both top graduate schools and employers alike.

So if you ever want to chat about the more mathematical or computer-intensive aspects of geology, stop by, or send me an email!

Faculty & Staff Notes continued...

Cindy Liutkus-Pierce Scott Marshall



Cindy

Faculty & Staff Notes continued...

Laura Mallard
Crystal Wilson
Joey Mosteller



Laura getting some field experience in anticipation of teaching the introductory water course.



Laura Mallard, Senior Lecturer

The Secondary Education program leading to a license in Earth Science is staying strong at ASU. We are graduating four new Earth Science teaches this year! Happily, our graduates are finding plenty of job openings across North Carolina. STEM Outreach continues in the Department of Geology with visits to K-12 classrooms. We have had many K-12 students visit our facilities in the last year as well. I continue to teach lecture classes that involve environmental geology. Introducing college students to new ways to look at environmental issues is a rewarding way to spend the day. I am still involved in the year-to-year process of updating our lab manuals. We are always improving our teaching with new ways to look at our amazing earth processes. When I am not at ASU, I am exploring the forests of the NC mountains and various beaches of the east coast with my 2 kids (6.5 and 3.5 years old). This year we have camped over a month at the beach and will continue that trend into 2015 (keeping up with my Oceanography research!). River and Earth Adventures, Inc. keeps us busy with whitewater rafting trips in the NC mountains.

Crystal Wilson, Lecturer

Our department continues to be a great place for an Appalachian Field Geologist. Last year, I was spoiled with pre- and post-SEGSA field trips. I enjoyed exploring and learning more about basement-Chilhowee cover sequences in the Mountain City Window, which are units that our students still map in Preparation of Geologic Reports. The second trip was in amphibolite & pelitic rocks of northwest NC and southwest VA and focused on regional deformation and correlation (or “de-correlation”?) of eastern Blue Ridge metamorphics. This trip was particularly relevant to my previous and continued work in the Ashe Metamorphic Suite at Elk Knob State Park. I am very excited to say that geology is now in the spotlight at the Park, and will be featured on a kiosk sign at the Park’s main trailhead.

I’ve enjoyed a return to teaching Physical Geology labs, and continue to teach mostly Environmental Change, Hazards, and Resources. I love showing students how geology affects their day-to-day lives. And there’s rarely a dull-moment given headline topics such as Keystone Pipeline, declining water supplies, climate change, dropping gas prices, and other Environmental issues we face in today’s world. It also turns out that my personal house purchase on the Linville Falls fault (riddled with failing slopes), underlain by acidic soil/groundwater, and beaming with high radon gas levels made for a few additional relevant discussions in lecture. Many thanks to student reviews and comments, I was recognized by the UNC system’s College Star program for bringing geology to a personal level to help students learn and live safely, even if the geology is not initially forgiving.

Joey Mosteller, Adjunct Lecturer

Joey Mosteller has been of recent assistance in the Appalachian State University Geology Department filling in as an adjunct professor teaching GLY1101 labs. He is a native of Western North Carolina and has a Master of Science degree from ASU where he is also an adjunct lecturer in the Appropriate Technology Department. In addition to his teaching duties, he spends some of his time at the Appalachian Energy Center as a research assistant working primarily on landfill gas to energy projects in North Carolina and Brazil.

Joey’s geology background traces back to the University of Kansas where he received his Bachelor of Science degree. After graduation he continued to work concurrently at both the Geology Department and the Kansas Geological Survey as the Thin Section Technician before moving back home to North Carolina. Joey is excited to reconnect with his geology roots by getting to spend time teaching in the ASU Geology Department.

Jack Callahan, Emeritus Professor

Hi to all the old graduates and drop me a line sometime at goldjec@hotmail.com and let me know how you guys are doing. I hope all of you are healthy and happy. Some of you might even be retired by now and I cannot believe it has been 12 years for me. I still enjoy getting out and looking at rocks and always make the Spruce Pine Mineral and Gem festival in August to look at the great mineral specimens. I still try to stay active and serve on the Peer Review Board for the NC Board for Licensing of Geologists.

Fred Webb, Jr., Emeritus Professor

Fred Webb continues to stay on the move after his retirement in 2004. Loren Raymond and I continue to wait for the formal publication of the two quadrangle geologic maps we completed for the Va Geologic Survey in 2009. Our manuscript for the areas are awaiting review. Loren (lead author), Anthony Love, and I have had two papers on Silurian rocks in SW VA published in GSA Bulletin and SE Geology recently.

Art Schultz of the USGS and I are collaborating on solving a fault problem that I discovered in SW VA. The problem involves a window (fenster) that I mapped over a half-century ago while a Ph.D. student at VA Tech. The window was studied later by an MS student from another school. He determined that the feature was not a fenster. Art and I are going to discover the “truth”. If the feature is actually (“totally”) a fenster, there are some interesting implications for the nature of thrust faulting the Valley and Ridge. Stay tuned — we hope, later, to have a GSA field trip to the problem area.

My wife Barbara and I attended the Vancouver meeting of the GSA in the fall. We took Amtrak from Hinton, WV, to Seattle, and then drove a rental car to the Olympic National Seashore for a few days, and then to Vancouver. The Empire Builder is a great train ride but not nearly so weird and long as the Trans-Siberian. The meeting and Vancouver were great, especially as we got to visit with some of our very great old friends. I was also became a Fellow of the GSA at the meeting.

Other than occasional days in the field with Arthur Merschat in the Mount Rogers area and some visits to renew acquaintances with Valley and ridge carbonates, my physical activity involves splitting firewood and working out at the local wellness center. I find that getting rid of my geology books, old notes, photos, and videos is taking more time than I thought it would. Despite all these old files, I continue to add more imagery with the Go-Pro which is quite a neat device for the field. This “stuff” accumulation will be different for you younger folks as you will have electronic media files that likely will be unreadable (think 5.5” floppy disks). Enough rambling. Peace to all. Stay in touch.

Retirement reception for Dr. Rick Abbott, Jr.

The Department of Geology invites the Appalachian community to a reception honoring the career of Professor Rick Abbott, who retired on 31 December after more than 36 years at Appalachian State University. The reception will take place on Friday, 27 February, from 4:00 pm to 5:30 pm in the atrium of Rankin Science South, adjacent to the McKinney Geology Teaching Museum. Refreshments will be served. Please stop by and thank Rick for his contributions to Appalachian.

Emeritus Faculty Notes

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Parting Shot — Dr. Casale demonstrates to field camp students some alternative uses for a rock hammer

