

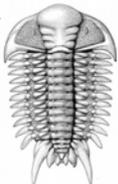
The
Boulder RUNdown

Spring 2016 Newsletter



DEPAUW

DEPARTMENT
OF GEOSCIENCES



Cover Photo: Students relaxing at the top of Harney Peak on Fall Break 2015 field trip to Black Hills, SD led by Prof. Jim Mills. Photo: Jim Mills

Message from the Chair

Welcome to the 2016 edition of The Boulder RUNdown. Many thanks to Scott Wilkerson, who once again served as “editor” of our annual newsletter. Before offering a brief review of the past year, let me say that we were all saddened to learn that Jim Madison passed away on December 15, 2015 after a long battle with cancer. Jim started teaching at DePauw in 1953 and retired in 1991, a career lasting nearly four decades. He touched the lives of literally thousands of students, and I know that many geoscience alumni still have fond memories of him. Jim hired me right out of graduate school, and we were colleagues at DePauw for eight years. I will always be grateful for his thoughtful mentoring during the early years of my teaching career. Jim’s presence in the department will continue in perpetuity because the endowed **James A. Madison Fund for Faculty Research** provides significant funding to support ongoing faculty research projects in the department. A donor who wishes to remain anonymous established this fund many years ago in Jim’s honor.

The past year was a busy and rewarding year in the Department of Geosciences. Aside from our normal teaching responsibilities, geoscience faculty members contributed to students’ education outside the traditional classroom in myriad ways. In January Term 2015, geoscience faculty offered three courses in the Extended Studies Program (a new name for “Winter Term”, where courses can now be offered as 0.5 course credits

and students receive grades). Jeanne Pope and Scott Wilkerson both offered on-campus courses in January. Jeanne taught “Zero Waste” and Scott taught “Introduction to GIS Using Google Earth.” Tim Cope and Jim Mills co-taught an off-campus course named “Assembling California” that had students doing geologic mapping in California. During Spring Term, Tim Cope supervised two students (Stephen Dobbs ’15 and Nick Williams ’15), who wrote senior theses based on their summer research with Tim in China. Both students gave oral presentations to the DePauw community at the annual Senior Showcase day in April 2015.



Stephen Dobbs '15 and VPAA Larry Stimpert posing after the presentation awarding Steve the Ferid Murad Medal. Photo: DePauw website

The Department of Geosciences was well-represented at the annual Awards Convocation in April 2015. Most significantly, Stephen Dobbs '15 (geology major) received the Ferid Murad Medal for academic achievement. This prestigious award was established in 2014 in honor of Nobel Prize winner Ferid Murad '58 and is awarded annually to one DePauw senior who has excelled academically or artistically during their four years at

DePauw. Steve was one of three finalists present at the Awards Convocation where he was announced as the winner. Congratulations Steve! Steve is currently attending graduate school at Northern Arizona University. The Department also awarded over \$10,000 in merit scholarship money to 8 students majoring in geosciences at the Awards Convocation (you can find the names of the award recipients elsewhere in this newsletter). These merit scholarships are made possible by the Department's endowed scholarship funds: the **Bieber Scholarship Fund**, the **Gault Memorial Fund**, the **"Rock" Smith Memorial Scholarship Fund**, and the **Wylie-Condit Science Scholarship Fund**. Thanks to all of you who continue to support our geoscience students through your contributions to these funds.

In May 2015 we graduated 17 geoscience students, which was the

highest number of graduates from the Department of Geosciences in history. Following commencement, students and faculty members remained active throughout the summer. Jim Mills and two students, Nick McCreary '15 and Tyler Donaldson '16 presented the results of their St. Francois Mountains research at the North Central Section of the Geological Society of America meeting in late May. Four other geoscience students remained on campus following commencement to conduct research with Jeanne Pope throughout the summer: Nick Meszaros '18, Peter Steiner '17, Sarah White '16, and Amelia Wilson-Wright '17. They helped Jeanne continue her research on agricultural runoff in Putnam County, IN.

Chris Bonniwell '94 (President, Wilcox Environmental Engineering, Inc) speaking with Kelsey Furman '16. Luke Lohrstorfer '16, Kojo Addaquay '16, and Sam Lucente '16. Photo: Fred Soster



During Fall Term 2015, Jim Mills supervised two students who were writing senior theses: Luke Lohrstorfer '16 and Tyler Donaldson '16. Jim also led a fall break field trip with twenty students to the Black Hills where they studied the geology and mineral resources of the region. Travel and lodging expenses for all students were paid for by the **F. Michael and Dorothy W. Wahl Endowed Fund for Geoscience Field Trips**. The students love going on field trips, and many of these students would not be able to participate on field trips without the generous financial support of the **Wahl Fund**. Plans are currently underway for a Spring Break trip to Moab, UT to study the geology of Arches and Canyonlands National Parks. During Fall Term we also had a visit from Chris Bonniwell '94, who gave a talk about vapor intrusion from groundwater contamination.

Finally, our geoscience program continues to attract a high number of students. We had thirteen first-year and sophomore students declare majors in geosciences last year, bringing the total number of geoscience majors to 32: 2 first year students, 12 sophomores, 11 juniors, and 7 seniors.

As you can see from my quick review of last year, the Department of Geosciences continues to be a vibrant department with both faculty and students engaged in a stimulating and challenging curriculum. Perhaps most importantly, faculty members continue to offer opportunities for educational activities outside of the traditional classroom, and the students in our program continue to take full advantage of these opportunities.

Now, a short review of my activities during the year. I had a full teaching load

in both Spring Term 2015 and Fall Term 2015. In the spring, I taught Earth & the Environment and Energy & the Environment. During Fall Term, I taught Earth & the Environment and Historical Geology. For Historical Geology, we went on a field trip to collect fossils from the Ordovician outcrops around Brookville, IN. I continue to serve as Chair of the department, a task made relatively easy by the collegiality and cooperation of my department colleagues.



Group photo at Brookville Lake while collecting fossils.
Photo: Fred Soster

On the research front, I was the lead author of "Potential Impact of Chironomus plumosus Larvae on Hypolimnetic Oxygen in Lake Erie" which was published in June in the Journal of Great Lakes Research (Soster et al., 2015, *J. Great Lakes Res.* 41: 348-357). I am currently working with a colleague and his Ph.D. student (University of Tulsa) on the history of heavy metal contamination from past mining activities on an oxbow lake. My role in the project is to date the layers in sediment cores collected from the lake using ^{210}Pb and ^{137}Cs geochronology.

At home, Jennifer and I continue to enjoy our "empty-nesters" status. Jennifer has turned into a running animal and

completed two half marathons last year. She routinely runs 40-50 miles per week. She continues to work in the School of Music as Assistant to the Dean and Special Projects Liaison. Erica continues her employment as a genetic counselor at St. Vincent Hospital in Indianapolis. Frederick is a junior at DePauw University, is a member of Delta Upsilon fraternity, and is majoring in Environmental Geoscience. Frederick also completed his EMT training and licensing exams, and he is now an EMT. He works several days each month for Putnam County Operation Life and has already helped save a few lives. Jennifer and I had a fantastic three-week trip out west last summer. We visited Dinosaur National Monument, the Tetons, Yellowstone, Glacier and then the Canadian Rockies. We had such a good time that we are planning a trip to southern Colorado and northern New Mexico this summer.

I enjoyed the e-mail correspondence with many of you this past year. Please stay in touch and let me know if your travel plans will bring you back to DePauw at some point this year. I always enjoy catching up with former students and hearing about your career paths after you graduated from DePauw.

James A. Madison

Jan 12, 1928-Dec 15, 2015

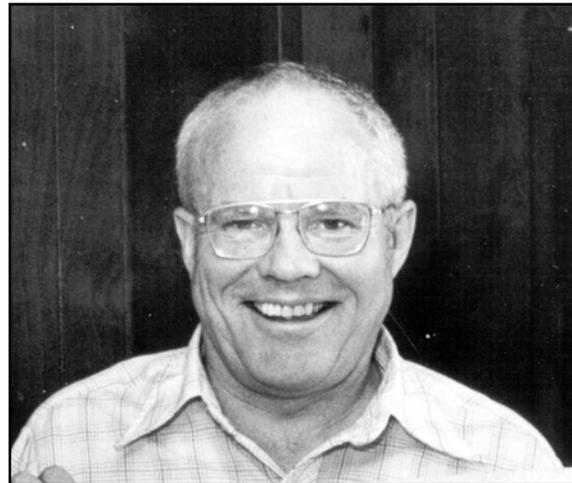
modified from the [Greencastle Banner-Graphic](#)

Dr. James A. Madison, 87, of Sylva, N.C., passed away in the early morning hours of Dec. 15, 2015, following almost a decade-long, brave battle with cancer.

Born in Woodstock, Ill., on Jan. 12, 1928, to James Ambrose and Esther Victoria Anderson, he moved with his mother and sister Virginia to Webster, N.C.

His mother was a first-generation American of Swedish descent.

In Webster, they lived with Robert Lee Madison and his wife Ella until Esther could afford to buy her own home in Sylva. After graduating Sylva High School, he attended Western Carolina University until he interrupted his education to join the Army from 1946-47. Upon returning to school, he earned B.A. and M.A. degrees from the University of North Carolina, Chapel Hill. He married Loy Malone of Louisburg, N.C., in 1953 and moved to Greencastle, where he began his teaching career. He earned his Ph.D. from Washington University in St. Louis and eventually became head of the Department of Geology and Earth Sciences at DePauw.



Jim Madison. Photo: DePauw Archives

Jim chaired several important administrative committees and became a member of the Sigma Xi Society while at DePauw. He retired from DePauw University after 38 years and moved back to Sylva. After his retirement, there was a scholarship at DePauw established in his name.

He was an avid outdoorsman and an accomplished carpenter. He made much

of his own household furniture and also built a sailboat, a canoe (including paddles) and custom bows, arrows, and wrist guards so that he could teach his children archery.

While he attended UNC, he became captain of their first gymnastics team and wrestling team and a Red Cross-certified water safety instructor. Later, during summer breaks from teaching at DePauw, he volunteered at the local pool in Greencastle to teach swimming and diving and coach the swim team. He was a member of the Indiana Guard Reserve.

While teaching at DePauw, he and his wife Sara traveled extensively, including semesters in eastern Europe and Argentina with extended time in Sweden, Russia, Hungary and Spain.

James is survived by his wife, Dr. Sara Sutton Madison; daughter Kathleen (Dr. Craig) Snyder and their children Madison, Connor and Kaylee and Madison's daughter Leila; daughter Martha and her son Wesley Tout; daughter Mary (Rob) Campbell; son James and his wife Paige and their four children Stefanie, Malachi, Penelope and James Robert Lee.



VELMEX Tree Ring Measuring system used by Jim Mills and his students for tree-ring analyses. Photo: Jim Mills

Department Scholarship Awards

Ernest R. "Rock" Smith Memorial Scholarship

Tyler Donaldson '16 & Peter Steiner '17

Charles L. Bieber Memorial Fund

Kelsey Furman '16, Alex Grissom '16, Fred Soster '17, & Lauren Van Fleet '16

Charles M. & Frances Wylie-Condit Science Scholarship

Gabby Jensen '17

H. Richard Gault Memorial Scholarship

Alex Ruger '17

Income from the

James A. Madison Fund for Research and the **F. Michael and Dorothy W. Wahl Endowed Fund for Geosciences Field Trips** help subsidize Department of Geosciences faculty-student research activities and student field trip costs, respectively.

Tim Cope

I need to get out and see some rocks. As I reflect back on the past year, it occurs to me that I haven't done any geologic fieldwork since last January! That's a record for me. Time to get back in the field. Fortunately, after seeing a few "Facebook memories" from New Zealand posted by students on our 2010 and 2013 trips, Jim and I have decided to offer our New Zealand trip once again in Winter Term 2017. See next year's newsletter for updates on how it went!

The last time I was in the field was Winter Term 2015. Jim Mills and I piloted a new field course in southern California that we offered for 0.5 credits and a grade (see the last newsletter for details from that trip). We stayed at Zzyzx for much of the trip (many of you have been there), camped at Furnace Creek (many of you have been there too), and stayed a few

nights in Las Vegas (never been there, don't recall a thing, what happens in Vegas stays in Vegas...). We mapped some spectacular geology, and kept ourselves extremely busy—and out of trouble!—the entire time. It was a blast!

Last spring, I developed and taught a new course in isotope geology. Students learned about nucleosynthesis, radiometric decay, stable isotopes, and applications of all of these in the geosciences. I really enjoyed teaching the course, since isotope geology is rapidly becoming my area of expertise. Teaching about the methods I employ in my own research was really enjoyable, and the process of developing the course gave me a much deeper and broader understanding the subject, which is good for my research. I got a lot of great ideas from this course.

All three of my 2014 summer research students took the isotopes class, and two of them completed senior theses last spring. Nick Williams wrote a thesis entitled "Response of the North China Block to Closure of the Paleo-Asian Ocean", about his detrital zircon samples and the story they tell about continental collision in Asia during the late Paleozoic. Steve Dobbs wrote a thesis entitled "Late Jurassic Tectonic Evolution of the Yanshan Fold-Thrust Belt, NE China", about sedimentary basin development during deformation of the North China Block. I am in the process of incorporating more regional data into both of these theses in order to submit them for publication. Steve and Nick: don't worry, I'll have them done soon!

Much of my summer was spent compiling data from three years' worth of China research and working to analyze and present those data in new and

interesting ways. In addition to putting together a GIS database of our field maps and sample locations, I've spent quite a bit of time learning to code data reduction schemes for U-Pb and Hf isotope ratios in R (a free statistical software and programming platform). Visualizing our data in different ways has brought out some patterns that I doubt we'd have seen otherwise (including the "heartbeat" of a volcanic arc!), and has led me to consider suggesting new methods of data reduction and presentation to the geochronology community. I presented some of this research at GSA last fall (thanks to those of you that attended!), and am now writing it up for publication.

I had a very busy semester of teaching last fall. The highlight of the semester was an excellent senior seminar. This is really my favorite class to teach, because I get to learn so much about the career goals of our graduating seniors, and because each one of the students teaches me something new about the topic that they choose to research. I always learn a lot in this course! The students this year put on a fantastic show. All of them gave well-informed, well-presented talks on topics ranging from carbonatite petrology to Holocene ENSO variability, and as usual, we had lots of fabulous discussions along the way.

Kids grow fast. Zoe is now 7, and she is developing an interest in science (she asked for a chemistry set for Christmas). She loves to watch Star Trek, and is gaga over Star Wars. Tess is 5, and beginning to develop some mad art skills. She also loves playing with Barbie. Kate is hoping to open a bakery in Greencastle soon (still awaiting a good space), and I have been enjoying watching the kids grow and eating fabulous baked goods every week.

Our home is filled with fresh bread, baked goods, kids art, test tubes, and Legos. Legos everywhere—both kids love to build. We're all doing great—hope you are too!

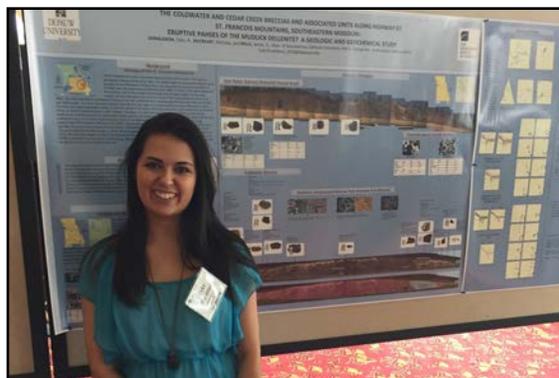
Jim Mills

Greetings! As you might well expect, it's been a very busy year. In January, Tim and I led an Extended Studies trip to southern California to teach majors basic field techniques (see last year's newsletter for details). For the rest of the spring semester, I was on sabbatical. During the sabbatical, I was able to finish two more chapter drafts of the Earthquakes and Volcanoes textbook. It will get done someday – consider this project like a volcano – long periods of dormancy punctuated by brief periods of fiery activity...

While on sabbatical, I also had the opportunity to write a small grant to the Mellon Foundation for the purchase of a VELMEX Tree Ring Measuring system, which I got! So, the Department of Geosciences now has an official 'Tree Ring Measuring Laboratory' that is housed in the old Stable Isotope Sample Extraction Lab in the basement of Julian. This January, I had two students (Haley Chute '18 and Mitch Bolin '17) working on an independent study project to measure tree ring widths on samples of red oak from the DePauw Nature Park. We hope to use these data to look at climate change in central Indiana over the last hundred years.

Also, I continued work with Nick McCreary '15 and Tyler Donaldson '16 on two roadcuts in the St. Francois Mountains of Missouri. Nick and Tyler dissected the geology of the roadcuts and presented the results of their work as posters at the

spring North-Central Geological Society of America meeting in Madison, Wisconsin. The posters were very well received! As a consequence of that work, Tyler is now pursuing a Senior Thesis on this area and is going to try to model the petrogenesis of the volcanic units from some of the possible parent plutons in the area.



Tyler Donaldson '16 presenting her research poster at the North-Central Geological Society of America meeting in Madison, Wisconsin. Photo: Nick McCreary

Last fall, I ran another a weeklong Fall Break trip to the Black Hills of South Dakota. I had twenty students tag along, and we had an excellent visit! This year we added a brief stop at the Mitchell Corn Palace (Hannah Wade '19 was suitably impressed!), a tour of Jewel Cave (even better than Wind Cave), and a visit to the South Dakota School of Mines Museum (great minerals and fossils) due to a rain-out at Bear Butte. Midori Kawaue '17, Vy Le '19, and Vanessa Gonzalez '17 made good friends with the prairie dogs at Devil's Tower.

The Badlands were amazing as usual (Best. Sunset. Ever.). Gabby Jensen '17 and Alex Ruger '17 spotted some really nice fossils in the sediments, and the baby rattlesnakes were pretty cute too.



2015 Fall Break field trip group at Badlands NP.
Photo: Jim Mills

Amelia Wilson-Wright '17, Ben Booher '18, and Peter Steiner '17 were overwhelmed by the fantastic behind-the-scenes tour that we received at the Black Hills Institute (led by Peter Larsen...Alex Ruger's '17 new best friend). We also got to see the new T-rex skeleton the museum was preparing... totally awesome. Fred Soster '17, EMT extraordinaire, was always ready with the first-aid supplies just in case we got into harms way. Cameron Stewart '17, Genna Chiaro '17, Sarah Farmer '18, and Stephanie Baxter-Ivey '17 were mineral-collecting fiends...great samples of staurolite, garnets, etc. Harney Peak was spectacular this year, warm and no wind... Alex Ruger '17, the next Jack Horner, gave a superb overview of dinosaur ecology at Dinosaur Park in Rapid City. And, the Beta Boys kept us eternally entertained with their hacky sack gymnastics (Logan Miller '18, Sam Short '18, Spencer Schillerstrom '18, and Caleb Van Arsdale '18). Dinner at the Firehouse was epic (thanks Fred!), Luke Lohrstorfer '16 and Mitch Bolin '17 almost sprouted gills, but Ben, we missed you again... We finally found a granitic pegmatite to collect, but sadly it had been pretty picked over. Lastly, we had the

fortunate opportunity on this trip to hear about the new rare earth element mine (Bear Lodge Mine) that is going to open in the Bear Lodge Mountains just north of the Black Hills in a year or two. This mine will hopefully give China a little competition for the world-wide sales of rare earth elements. All in all, it has been another great year. I hope all of you have had a wonderful year and we look forward to hearing from you soon!

Jeane Pope

Last January, Associate Professor of Philosophy Jen Everett and I co-taught an on-campus Winter Term called "Zero Waste and the Ethics of Stuff." This was the third time that we had worked together on an environmentally-themed class and the second time that we had specifically looked at what is known as the Materials Economy (e.g., everything that contributes to the GDP except some services). But, the 2015 class was different in a number of ways. First, DePauw is now offering WT courses for academic credit, which bumped up the expectations. It was demanding for students who had to spend three intense weeks in the class, but they really learned a lot. Two of the students in the class have declared as Geo majors and others are thinking of minoring. Another, more exciting difference from our previous offerings was that the students all lived together in an on-campus house so that they could really try out Zero Waste living. You probably won't be surprised to hear that they found it challenging to put their sincere environmental beliefs into practice. Nevertheless, the experience opened their eyes to the complexity of sustainability in a meaningful



Peter Steiner '17 and Nick Meszaros '18 gathering water samples at one of their research stations. Photo: Sarah White

and valuable way. As with our previous courses, we offered a number of field trips to landfills, incinerators, and recycling facilities so that students got to see what really happens to all their stuff. For me, this is the most rewarding part of the class.

Last summer was quite busy, too. Four geomajors worked with me on my ongoing research project of examining the effect of agricultural runoff on water quality (Sarah White '16, Peter Steiner '17, Nick Meszaros '18, and Amelia Wilson-Wright '17). The spring had been pretty wet, so it was hard to get into our sites in June, but we had a fantastic field season after that. The students had a total of seven sampling days and completed over two hundred chemical analyses of the samples. From this information, we have been narrowing down the specific

sources that are contributing the most nutrients to the Big Walnut Creek headwaters. In the future, we will examine land use practices in these areas to see if we can identify mechanisms by which the nutrients are getting into the waterways (e.g., overland flow vs. groundwater discharge). This is important because it will influence remediation techniques. In many cases, state and local agencies are able to help landowners pay for BMPs (best management practices). To be efficient with these funds, the landowner needs good information about water and nutrient flow from their property.

I was particularly proud of the presentation that the students gave as part of a new summer tradition at DePauw called TEACHtalks (modeled after TEDtalks). These seminars were held in the Julian Atrium most Mondays and were attended by a wide cross section of the University, including several Vice

Presidents and their staffs. Although Amelia was out of the country at the time, Sarah, Peter, and Nick did a **fantastic** job! They were clear and informative, while being natural, relaxed, and (appropriately) funny! Kudos to the students for their hard work.



Prof. Pope's research team wading downstream to a sample site (and testing how waterproof those waders really are...). Photo: Sarah White

DePauw's sustainability program also had another good year. I am very pleased that Chris Hoffa, a sustainability engineer, has joined the Facilities team. Chris brings with him a wealth of experience on energy efficiency and alternative energy. In October, he and I presented a draft of DePauw's (updated) Climate Action Plan to the University's Board Of Trustees and will ask them to formally endorse it at their May meeting. Chris, Anthony Baratta (the Director of Sustainability and DPU class of 2010), and I meet regularly to plan and coordinate sustainability activities and strategies. A number of these are carried out by students in the Sustainability Leadership Program (SLP), which includes several geomajors: Mitch Bolin '17, Vanessa Gonzalez '17, Gabby Jensen '17, Mackenzie Jones '18, Logan Miller '18, Madeline Piscetta '17, Cameron Stewart

'17, and Sarah White '16. Information about this popular and successful program can be found on DePauw's Office of Sustainability [website](#).

In other big sustainability news, this fall I wrote a successful proposal to the Indiana Office of Energy Development's Community Conservation Challenge (CCC) program. Funds will be used to install new LED lighting in the Neal Fieldhouse, to install real-time energy usage monitoring devices on campus and in the Greencastle community schools, and to develop pedagogical materials for energy education. The new energy efficient lights are expected to reduce energy consumption by over 170,000 kW/year while maintaining the same quality of light for the courts, which will help us reach the goals outlined in the Climate Action Plan that was presented at the BOT meeting in October. Based on current energy prices, this energy reduction equates to a savings of approximately \$12,650/yr. The CCC Program requires applicants to provide matching funds to be eligible for this award. Fortunately, the University was able to apply dollars in the newly established Green Revolving Fund (GRF) to help meet this obligation. A large portion of the savings from this project will be earmarked to support additional sustainability projects in the future.

On a personal note, this year was a big transition for my daughter, Luna, who has now started kindergarten. It was great fun walking to school with her in the mornings this last fall. I have also enjoyed volunteering at the school in their Reading Counts program. Next year I will be on sabbatical, so I expect to have a number of exciting updates on my new project then. Stay tuned.....

Scott Wilkerson

Greetings from Greencastle! I hope this note finds you and yours happy, healthy, and enjoying life.

My teaching load was relatively light this year as I had reassigned time in Spring 2015 for my faculty fellowship project, and I was on sabbatical Fall 2015. However, I did manage to teach Structural Geology & Tectonics to an enthusiastic group of senior geomajors. So... of course, we made our regular pilgrimage to Baraboo, WI to study structures associated with the Baraboo Syncline. This trip was especially fun as my youngest son Ben (then a 13-year-old seventh grader) joined us for the trip. Ben eagerly participated in our activities, learning how to use a Brunton and leveraging his math skills to help the students translate between strike/dip and dip/dip direction. We also visited a new 'crop in Parfrey's Glen (see pic). This area lies on the southern flank of the south limb of the syncline and contains spectacular boulder and pebble conglomerates derived from the Baraboo Quartzite.



2015 Baraboo, WI field trip group at Parfrey's Glen. The cliffs contain lenses of Baraboo Quartzite pebbles and boulders. Photo: Scott Wilkerson

The Baraboo trip was an excellent segue for a Summer 2015 research project

that I worked on with my Ph.D. advisor, Steve Marshak. As a preface, the Baraboo area contains multiple foliations: two are fairly well understood (bedding- S_0 & phyllitic cleavage- S_1). However, a crenulation cleavage (S_2) that kinks S_1 and that creates enigmatic down-dip-verging folds has been difficult to explain (most geoscientists call upon some type of vertical loading event to cause the down-dip-vergence). After wading through the kink-fold literature, we developed an interpretation that these features were actually a type of antithetic kink fold that could be explained due to variability of frictional resistance along the S_1 surfaces during progressive development of the Baraboo Syncline. We've presented this work at the GSA Annual Meeting in Baltimore and hope to submit a paper for review sometime this year.

Speaking of summer projects, I also built (with the help of Ben and Zach) an augmented reality sandbox to visualize topographic landforms (see pic next page). The system uses a Microsoft Xbox Kinect sensor/camera to measure the elevation of the sand surface at the millimeter scale. These elevation data are collected by a laptop computer, which then computes the topographic contours of the sand surface and subsequently sends a color-coded topographic map to a short-throw projector mounted above the sandbox. The projector overlays the color-coded elevation map and contours back onto the sand surface...in real time. That is, users shape the sand into landforms, and the colored topographic map automatically readjusts to reflect those changes in surface elevations. In addition, users can also simulate digital water by causing it to "rain" over the area and watch the water

flow downhill into streams, ponds, and lakes. We have used the AR sandbox both in our classes and in outreach to the local schools. This project was supported, in part, by the **James A. Madison Fund for Faculty Research**.



Augmented reality sandbox for interactively studying topographic landforms. Photo: Scott Wilkerson

On a related visualization front, I continued my work with Google Earth. Specifically, for my sabbatical, I worked on the second edition of the Geotours Workbook. This edition not only will be revamped to reflect updates in the Google Earth software, but it will also include all kinds of cool exercises and revised activities on topics typically covered in introductory geoscience courses. In addition, I'm also working on a book/e-book using digital topographic maps in Google Earth to teach map interpretation and geomorphic landform analysis. I've

completed drafts of two chapters in my first of a three-year faculty fellowship. This semester I'm currently refining those chapters and hoping to craft drafts of additional chapters.

The Wilkerson family continues to stay busy with various activities. Zach is 18 and a senior in high school, whereas Ben is 14 and in eighth grade. Ben, much to his delight, is taller than Zach (and is quickly closing in on me). Both remain active in various academic endeavors, sports, and music activities. Ben is looking forward to high school, whereas Zach is applying for colleges (DePauw is currently first on his list). Beth continues her work as GIS Specialist at DePauw...working with faculty, staff, and students on various GIS projects.



Ben, Zach, and Beth at Red Eagle Falls in southern Glacier NP. Photo: Scott Wilkerson

For our summer vacation, we traveled to the Canadian Rockies and Glacier NP. On the trip, we returned to many of our favorite locations, yet managed to explore new areas as well. It was especially neat for Beth and me to revisit these spectacular landscapes and watch the boys discover and appreciate what we've come to love.

Alumni News

Thanks to everyone who has sent us information about job openings and internship opportunities...you all are incredible resources for our current students and alumni looking for positions! Also, please keep us informed about your activities.

Charles C. Bates '39 was recently featured on the DePauw website. Check it out at: <http://www.depauw.edu/academics/departments-programs/geosciences/news/details/138>

Bill Shilts '63 recently retired from the University of Illinois Prairie Research Institute, which he helped start in 2008. Bill was previously chief of the Illinois State Geological Survey and Illinois' state geologist since 1995 (see <http://www.depauw.edu/news-media/latest-news/details/21851/> for a brief synopsis of Bill's many contributions to the field of geology).

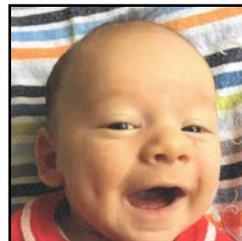
Bob Bornstein '87 recalls the fond memory of "winning a few games of racket ball from a power player" (aka Prof. Fred Soster) during his days at DePauw. He also notes that "It is great students are still provided the opportunity to travel to West Virginia and get into the field with such a knowledgeable and enthusiastic expert."

Nic Brissette '00 has moved to Delta Oil and Gas in the Dallas/Fort Worth area. Nic brings lots of exploration experience in the Permian Basin to the new company. He also has started Fabrik Industries where "I will be looking at aquifers for fresh water sources in smaller communities in Texas as I drill my wildcats. I'm also wanting to get into water pipelines, northern glacial sands for mining, and environmental engineering around tank batteries in Texas."

Jennifer (Berry) Phillippe '01 is operations manager of Investigation and Remediation Services at Wilcox Environmental Engineering, Inc. in Indianapolis. Life is very busy as she balances a full-time job with 3 children and a husband away on military duty. However, we hope to get her back to campus sometime in the near future to share her environmental expertise with current students.

Phil Mooney '07 now is the geology department technician at Sonoma State University, where he has "taught 2 different intro classes/labs so far and really enjoy it" and has led many field trips, leveraging several stops at outcrops from DPU field trips in which he participated. We look forward to the "young Tim Cope" stories when you get a chance... Phil and Mandy are married and are looking forward to purchasing their first home in Marin County, CA soon.

Bill Alward '08 and wife Rebecca are the proud parents of Ansel William Alward, who was born on Sept. 17th. Hopefully, Bill is as skilled at diaper-changing as he is at geology!



Ansel William Alward '37?
Photo: Bill Alward

Beth Drewes '08 reports that she has accepted a permanent geologist position with the USGS in Anchorage, AK. In addition, she also just became engaged. Congratulations, Beth!

Nick Vetz '08 writes that he completed his M.S. from Boise State University about 3.5 years ago. His research focused on field mapping, geochronology, and isotope work in the Humboldt Range in NV. He now is an ore control geologist with the Barrick Gold Corporation.



Bill Alward '08 & Tad Alford '09 held a "reunion" in the Wind River Mountains where they did some hiking in the Big Sandy Opening area. Photo: Bill Alward

Lauren Schaefer '09 is featured as an “Alumni of Distinction” on DePauw’s website. Check it out at : <http://www.depauw.edu/admission/profile/lauren-schaefer>. Lauren hopes to finish her Ph.D. in Spring 2016, and she already has two of her manuscripts published...congratulations!

Jay Wellik '10 is now working as a volcanologist/seismologist for the USGS Volcanic Hazards Program at Cascades Volcano Observatory. Congratulations on landing your dream job, Jay!

Julia (Shaw) Sessions '11 finished up her last semester of classes last fall and hopes to defend her thesis research this spring. She has been invited to be a co-author on a paper on her research for an AAPG memoir scheduled to be published in 2017. In addition, Julia and Nephi bought their first house last summer (a two-story, Victorian-style house in Broken Arrow, OK). And, as if that isn’t enough excitement, they are expecting a little girl this coming April...congratulations! Julia notes that *“she has already been on geology field research”*...send her to DePauw in a few years!

Jordan Thomas '13 works in the lab division for Environmental Analysis, Inc. in Chicago, IL. *“I analyze for asbestiform minerals in building materials using a polarized light microscope, so basically optical mineralogy. I want to thank you for all of your lessons and advice at DePauw. I would have never made it to this new position without your help. I never imagined using old mineralogy terms like refractive index and angle of extinction on a daily basis”*.

Bibek Dhakal '14 let us know that his family and friends were not harmed in the April 2015 Nepal earthquake. He said, *“I wish I could say that everybody were as fortunate as me in regards to their family and friends. The recovery will take many years but I believe in resilience of Nepali people.”* Our thoughts are with you and your family as the area recovers from this disaster.

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Katherine Shover '14 writes to share her experience as an intern with ExxonMobil: *“it was AMAZING!!! The internship was structured really well, the lecture series for geoscientists and the computer science seminars were super interesting, my group in geoscience computing was incredibly friendly and great to work with... My projects went very well, and I think my mentor and supervisor were very pleased with my work.”*

Ali Sullivan '14 is an environmental education instructor for the Nature's Classroom Institute, WI. She recently returned to Greencastle for a short visit with the Cope's and is doing great.

Forrest Kunkel '15 is a staff geologist with Mundell & Associates in Indianapolis, IN. Forrest continues to develop his geophysical expertise as he commonly works on projects involving electrical resistivity profiling and surface wave seismic analysis.

Nick Williams '15 interned at Mundell & Associates in Indianapolis for a month this past summer and then did three weeks of field work on an allochthonous salt weld in South Australia as part of his graduate work at Northern Illinois University. He recently applied for an NSF Graduate Research Fellowship...good luck, Nick!

Anna Urso '15 recently became a member of the HiRISE team at the University of Arizona. She is working on a “NASA MDAP grant, *“Characterizing Active Aeolian Surface Processes on Mars.” This research focuses on monitoring dune migration and sediment flux, which will answer questions about Martian winds/climate, sedimentary rock evolution, and surface erosion. I just finished creating a global map of Mars that illustrates the locations of all known dune forms and whether they are active, along with the top 10 proposed landing sites for NASA's Mar 2020 mission and the 4 proposed ExoMars landing sites. ... I am also working part time on a project studying Recurring Slope Lineae...possible liquid surface water on Mars!”* She adds, *“I wanted to write to thank you all so much for everything you do at DePauw. I thoroughly enjoyed every class, trip, and meeting! Being a part of the geoscience department was a huge positive in my college experience.”*



“Retired” cyclist Phil Mooney '07 on the cover of Bicycling magazine. Photo: Phil Mooney



Nick McCreary '15 and Tyler Donaldson '16 studying a roadcut outcrop in the St. Francois Mountains, MO. Photo: Jim Mills

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