

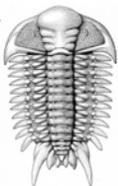
The Boulder RUNdown

Spring 2017 Newsletter



DEPAUW

DEPARTMENT
OF GEOSCIENCES



Cover Photo: Students investigating a spring emerging from a cave at Spring Mill State Park on a karst field trip led by Dr. Scott Wilkerson. Photo: Scott Wilkerson

Message from the Chair

Here is the 2017 edition of **The Boulder RUNdown**, the annual newsletter from the Department of Geosciences. Scott Wilkerson continues to serve as the “editor” for the newsletter.

Once again, the geosciences department had an eventful year. Faculty members continue to lead stimulating field trips to support our field-based curriculum, and students continue to take advantage of these opportunities to get into the field and onto the rocks. During Spring Break 2016, I took a group of 9 students out to Moab, Utah to see the spectacular geology of Arches and Canyonlands National Parks (see photo below). It was a long two days of driving each way, but we were rewarded with fantastic weather and beautiful rocks during our time in Moab. For Fall Break 2016, Jim Mills took a group of 18 students to

examine the volcanic fields of southern Colorado and northern New Mexico. Scott Wilkerson took 6 students up to Baraboo, WI for his annual Structural Geology & Tectonics field trip during Spring Term 2016. Scott also led two day-long field trips for his Map Interpretation class: one to examine karst topography in southern Indiana, and a second trip to look at glacial features in east-central Illinois. Tim Cope took his Sedimentology & Stratigraphy class on a one-day trip to southern Indiana to examine tidalites in the Mansfield Formation. The **F. Michael and Dorothy W. Wahl Endowed Fund for Geosciences Field Trips** covered all transportation and lodging expenses for the students who participated on these trips, and also paid for a group meal for all of the participants. We had one student/faculty summer research project this year. Jim Mills worked with Nick Meszaros '18 on a research project in the St Francois Mountains, which included a week of fieldwork in southeastern Missouri.

Group photo at Dead Horse Point State Park, Utah. Photo: Fred Soster



The Department awarded over \$11,000 in merit scholarship money to 10 students majoring in geosciences at the annual 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 endowed funds.

Our geoscience program continues to attract a large number of majors. We presently have 37 majors: 2 first-year students, 12 sophomores; 13 juniors, and 10 seniors. Twenty-five of these students are majoring in environmental geosciences and 12 are majoring in geology. Currently, there are no students majoring in earth sciences. Last spring we graduated 4 environmental geoscience majors and 3 geology majors, and this spring we will graduate 5 environmental geoscience majors and 5 geology majors.

My academic year consisted of a full teaching load in both Spring Term 2016 and Fall Term 2017. In the spring, I taught Earth & the Environment and Energy & the Environment. During Fall Term, I taught Earth & the Environment and a First-Year Seminar entitled, "Challenges of the Twenty-first Century: Energy, Food, and Water". On the research front, I completed data collection for a project 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. Now that we have the

data, we have to figure out what it all means.

Jennifer continues to work in the School of Music as Assistant to the Dean and Special Projects Liaison. Erica changed jobs and now works for Sequenom as a Clinical Liaison. Her job includes weekly travel all over the United States, which she thoroughly loves. Oh to be young again! Frederick is a senior at DePauw University and is eagerly looking forward to graduation in May. He continues to work several days each month for Putnam County Operation Life as an EMT. He has applied to several graduate schools to get an advanced degree in meteorology. He has one offer, but is waiting to hear from the other schools before making his final decision. Jennifer and I had another fantastic three-week trip out west last summer. We visited Colorado Springs where we attempted to get to the top of Pikes Peak, but had to turn around at the 12,000 foot level due to snow. We then went to Durango, CO where we had the opportunity to drive up to the headwaters of the Animus River to look at the environmental impact of the acid mine drainage release that turned the river bright red, which received national news coverage. What a mess! We also visited Great Sand Dunes National Monument and Mesa Verde National Park. Next, we headed south to Santa Fe and stayed at the Buffalo Thunder Resort for several days. No gambling or golf, just hiking and biking the area. On the way home we visited Dodge City, Kansas of Gunsmoke fame. I just had to do it.

Please stay in touch and let me know if you plan to visit campus so that we can get together.

- Fred

Department Scholarship Awards

Ernest R. "Rock" Smith Memorial Scholarship

*Genna Chiaro '17, Gabby Jensen '17,
& Fred Soster '17*

Charles L. Bieber Memorial Fund

*Elise Johns '18, Nick Meszaros '18,
Spencer Schillerstrom '18, & Peter Steiner '17*

Charles M. & Frances Wylie-Condit Science Scholarship

Haley Chute '18 & Logan Miller '18

H. Richard Gault Memorial Scholarship

Sam Short '18

Income from the

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

Tim Cope

Hello everyone - It's been another busy and productive year. I have been spending most of my time preparing for field trips, teaching my usual courses and participating in a new experimental course, publishing work related to my NSF-sponsored research in China over the last five years, and planning for my upcoming sabbatical during AY 2017-18.

In addition to teaching Sedimentology & Stratigraphy last spring, and Earth & the Environment and Introduction to GIS last fall—three of my favorite courses!—I also participated in a team-taught experimental course for incoming non-science majors provisionally titled, "Paradigm Shifts and Discovery Process in Science". This is an interesting new course that was loads of fun to teach, and several of the formerly "non-science" students in the course are

now taking Fred's Earth & the Environment course, which I consider a "win" for our department. The class is geared towards giving students an understanding of how science is done, by blending topics from several different science disciplines and drawing similarities between them. For my part, I taught a three-week mini-workshop in applied tectonics, in which students identified magnetic reversals in deep-sea cores, applied what they had learned to magnetic reversals on the seafloor, and combined these data with global observations of earthquake occurrence, fossil data, and a broader seafloor age model to discover seafloor spreading on their own. The hands-on experience they had synthesizing all the data was hopefully a valuable experience for all of them.

I've also been busy writing papers related to my China research. I spent much of last spring helping one of my Chinese graduate student colleagues finish a manuscript we've co-authored entitled "Out-of-sequence thrusting in polycyclic thrust belts: an example from the Mesozoic Yanshan belt, North China Craton", now published in the AGU journal Tectonics. While we were finishing that manuscript, I was working on a new paper of my own (now accepted to Earth and Planetary Science Letters) that uses U/Pb and Lu/Hf geochemistry of detrital zircons to document the history of Paleozoic and Mesozoic arc magmatism on the margins of the North China craton. I have several more papers on the horizon, at least two of which will have student co-authors (hang tight, Steve and Nick, I'm getting to them!).

Last summer I purchased a Phantom 3 Professional drone. I am currently working to get FAA-certified as a professional operator so that I can use this in my

classes. I plan to incorporate aerial photography into both the GIS and Field Experiences courses. Wouldn't it be great to have high-resolution photography of an outcrop that we can't access in person because it's perched high on a cliff? Won't it be cool to be able to make high-resolution topographic maps using a grid of vertical aerial photographs taken from different vantage points? Coming soon...

Next year is my sabbatical, and I plan to make the most of it. I will be working from home, so if anyone has plans to visit, my time will be flexible! Family is doing great. Zoe is now 8, and Tess is 6. Zoe loves math, science, piano, and karate. Tess enjoys gymnastics, reading, and art. When a suitable property become available in Greencastle, Kate will open a bakery, but for now she is selling baked goods from home. Her newest creation is croissants. Yum!

- Tim

Jim Mills

Kia ora!! Another year, another trip to New Zealand, another summer of research, and another epic fall break trip. Does the fun ever stop? And the answer, of course, is NO!

Where to start? Well, Spring 2016 is probably as a good a place as any. In late Fall 2015, I was approached by the Hubbard Center Winter Term Director about the possibility of doing a site visit to the major universities in New Zealand. Site visits are a method for DePauw's off-campus study service providers (e.g., International Studies Abroad (ISA)) to introduce off-campus study staff and faculty to their study abroad programs. So, after much thought and consideration (about 1.029×10^{-9} seconds), I said sure, why not? So for almost two weeks in

March, I was able to visit the University of Auckland, Auckland Technological University, University of Canterbury, and the University of Otago (hi Haley and Logan!!). I got to meet lots of wonderful staff, faculty members, and students and now have a much better grasp of what New Zealand universities have to offer our students, and, what ISA does with our students when they decide to study abroad (and they do a GREAT job with our students from the time they leave home for the airport till they walk back into their homes a few months later – as many of you well know).



Nick Meszaros '18 collecting field data on Precambrian volcanics in the St. Francois Mts., MO. Photo: Jim Mills

Over the summer, I worked with geology major Nick Meszaros '18 in the St. Francois Mountains of southeastern Missouri. We were looking at the far southwestern exposures of Precambrian volcanic units and some of the outlying granites. We spent over a week in the field playing host to ticks and chiggers and working in unrelenting heat and humidity – perfect field conditions! Fortunately, all of the rattlesnakes must have been on vacation... In spite of all that, Nick had a great time and did superb work making thin sections, preparing geochemical

samples, completing the petrographic analyses, and, interpreting the geochemical data. Nick presented the results of his work as a poster at the DePauw Science Research Symposium in the fall. All in all, another great summer of research!

are doing well, and it has been wonderful seeing and hearing from many of you this past year. Stay in touch!
- Jim

Jeane Pope

Jeane is on sabbatical for the academic year.

Scott Wilkerson

Greetings from Greencastle! I hope that life is good for you and yours.

This year was quite busy (and productive) for me. My time was divided between teaching several courses and working on my faculty fellowship and sabbatical projects. One would think that at this point in my career most of my courses would be “cast in stone”. However, I always seem to find myself revising each course to incorporate new materials, new case studies, new approaches, etc. This year was no different, although some of the revisions dovetailed nicely with my reassigned time work. Specifically, I used draft sections of the revised Geotours Workbook 2e for my Introduction to GIS using Google Earth course and draft chapters from my Map Interpretation of Topographic Landforms Using Google Earth faculty fellowship textbook project for my Map Interpretation course. The latter, in particular, were very effective as we used high-resolution topographic map overlays draped over the 3-D Google Earth topography to gain insight into the nature of topographic landforms in various geological settings (nothing like rotating geo-referenced topographic maps in 3-D!).



Fall Break trip to Southern CO and Northern NM. Spanish Peaks with a radial dike in the background. Photo: Jim Mills

In October, I ran a Fall Break field trip to a new area – southern Colorado and northern New Mexico. Eighteen students and I visited the Spanish Peaks (fantastic radial dike swarm!), the Great Sand Dunes National Park, the Raton Volcanic field (where we hiked the crater of Capulin), a beautiful cinder cone, and visited the Valles Caldera (spectacular!). In addition, we were able to visit the University of New Mexico’s Harding Pegmatite Mine to do some mineral collecting. To top it all off, we got to visit the dinosaur trackway at the Clayton Lake spillway in northern New Mexico, and were able to put our fingers directly on the K-T boundary just outside of Raton.

The rest of the year was spent preparing for the next epic New Zealand Winter Term trip (stay tuned for details in next year’s newsletter). We hope all of you



Map Interpretation students exploring a swallow hole in the bottom of the Wesley Chapel Gulf karst window. Photo: Scott Wilkerson

In conjunction with these courses, I also led several field trips. In Map Interpretation, we visited the Lost River karst terrain in south-central Indiana. The group first visited several caves, karst windows, and springs at Spring Mill State Park, and then proceeded to “follow the water” of the Lost River as it flowed (and disappeared) across the Mitchell sinkhole plain. The group braved some stinging nettle to observe how water from the Lost River was diverted into the subsurface at the famous Stein swallow hole. We then “found” the Lost River where it temporarily reappears at the Wesley Chapel Gulf karst window. Finally, the group stopped at the

Orangeville Rise resurgent spring where water from the northern part of the Lost River basin re-emerges from a limestone cliff to continue flowing at the surface as the Lost River.

The Map Interpretation class also traveled to the Mahomet, IL area west of Champaign to link up with Illinois State Geological Survey glaciologists to study glacial landforms. In addition to the prominent recessional moraines there, we visited several exposures along the Sangamon River and its tributaries and saw first-hand how to map and interpret different types of glacial deposits. In particular, there is an extremely interesting story in the vertical stacking of the deposits that clearly show the advance and retreat of the glaciers. Lastly, in Structural Geology & Tectonics, we returned to Baraboo, WI to collect structural data to map the Baraboo Syncline and to observe the many mesoscopic structural features present there (e.g., multiple cleavages, small-scale folds, etc.). Baraboo is one of those areas that serves as an excellent outdoor classroom, providing an ideal capstone for the course. I always enjoy taking students there and watching the pieces click in place for the students as we traverse the fold.



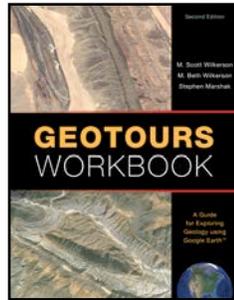
Speaking of Baraboo, in the last newsletter I shared that I was working with my former Ph.D. advisor Steve Marshak on understanding the multiple generations of mesoscopic foliations and folds present in the area. We presented this work at GSA and published a chapter on structural geology

Map Interpretation students learning from Illinois Geological Survey glaciologists how to map and interpret glacial deposits in the Mahomet, IL area. Photos: Scott Wilkerson

of the Baraboo Syncline in Geology of the Baraboo, Wisconsin, Area: A GSA Field Guide #43. We are presently working on a manuscript that details how the enigmatic second generation foliations and folds developed during the formation of the Baraboo Syncline.

In addition to this research, I also have been busy revising the Geotours Workbook 2e. I'm

happy to report that Beth and I wrapped up our work in late 2016, and the new edition was published in January 2017. The changes in this second edition were fairly substantial with updated images and procedures for using Google Earth Pro, significant changes and improvements to the topical questions, and a dramatic increase in the number of international examples in the various Geotours site libraries for each topic. We are using this new edition in Earth & the Environment this spring, and the response thus far has been very positive.



Google Earth Geotours Workbook 2e. Photo: W. W. Norton

On the home front, things are going well. Our youngest son Ben is a freshman in high school. He is active in music, performing in the band and participating in regional and state instrumental and vocal contests. He also participates in soccer (playing holding mid) and basketball (playing center on the C-team and JV team as he is now 6'2"). He also is a member of several academic teams (e.g., Spell Bowl, Math, and Science). Our oldest son Zach is a first-year student at DePauw. He just declared computer science and physics as double-majors, is a Science Research

Fellow, and is an ITAP intern. He and some friends in the physics club are building a hovercraft with Professor Hale...I'm looking forward to a ride! Beth remains very active as GIS specialist. She continues to work with many different faculty on research and class projects. She also has been working with Facilities and the Network Team mapping the campus at all levels. We stayed around Greencastle this past summer as we were working on the book, and Zach had a job. We're hoping to address our need for a "lithic-fix" this summer with a trip!

I wish all of you the best this year. Please stop by if you are in town. - Scott



Alex Ruger '17 was interviewed for a television news piece on his internship work on T-Rex fossil reconstructions (<http://www.kotatv.com/content/news/T-Rex-found-in-Montana-put-together-in-Hill-City-383413721.html>). Photo: KOTA News

Genna Chiaro '17 has become quite the world traveler...first a summer in Nepal and then off-campus study in Scotland. Her passport is getting used....but what is the deal with lichens? Photos: Genna Chiaro



Blog - <https://intrepidtraveler7.wordpress.com/rocks-in-nepal/>

Alumni News

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

Charles C. Bates '39 passed away in Green Valley, AZ at the age of 97. Charles was quite an accomplished alum of the department (<http://www.depauw.edu/academics/departments-programs/geosciences/news/details/138>), and we will certainly miss receiving his letters and stories.

Chris Herin '84 sent the department well wishes from Boca Raton, FL, where he works as a principal hydrogeologist for Geosyntec Consultants, Inc.

Garry Stevenson '86 works for CENCOR, Inc. in Indianapolis and writes, *"The news of Doc Madison's passing brought back many memories of him, especially our first Winter Term Keys trip and scuba diving with him."* Garry is busy on several projects on the environmental consulting front, including a recent installation of an active soil/groundwater remediation system (Dual-Phase Extraction) that he offered to show our students.

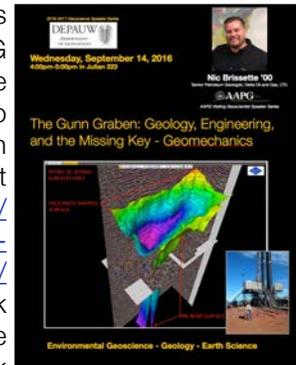
Chris Bonniwell '94 visited campus for Wilcox Environmental Engineering, Inc. to participate in a job fair. He writes, *"As always, happy to do my part as an alumni to help students understand what kind of opportunities there might be in my industry for whatever their interests and skill set might be. ... I'll admit that myself and many colleagues have a preference for those that call themselves geologists. Let me know if there is anything I can do to help DePauw students learn a little more about career opportunities in the environmental consulting industry. Always looking for an excuse to pick up Marvins."*



Jennifer (Steadman) Ryan '96 is an assistant director with Ivy Tech Community College in Columbus, IN. She focuses much of her time on the iGrad program, an intervention program for high school students who are at risk of dropping out. She writes, *"In 4 years, the drop out rate in Bartholomew County has been cut in half. We are now developing the college and career portion of the program and are working to eventually expand the program throughout southeast Indiana."*

Tony Gibson '99 dropped by the department to touch bases with us (and to see the new Hoover Dining Hall). Tony is the executive vice president of Murvin Oil, an independent oil operator in the Illinois Basin.

Nic Brissette '00 was named a 2016 AAPG Visiting Geoscientist. He returned to DePauw to share his presentation with the department (<http://www.depauw.edu/academics/departments-programs/geosciences/news/details/181/>). Nick has become a passionate proponent for a rock mechanics approach to hydrocarbon exploration.



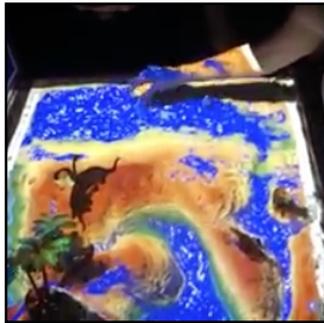
Nic Brissette's '00 talk flyer.

Chris Amidon '02 has been promoted to Supervisory Park Ranger at Isle Royale National Park based out of Houghton, MI. *"I'm Isle Royale's Web and Social Media coordinator, Volunteer Coordinator, oversee a visitor center and ranger staff, and train staff, but now I also manage a fee collection program, all park statistic collection, a ferry reservation system, an artist-in-residence program, and all the other odds and ends park rangers have to do."* He adds, *"I enjoying checking in and hearing about what's going on with the department. Some time I'll have to get back to Greencastle to shoot the breeze in person. I won't forget that you all helped to craft me into the successful ranger I am today."* Chris is married to Erin, and they have three children: Tess (7), Nigel (5), and Gwen (3).

Katy (Adank) Ward '05 writes that the Ward family has grown as they welcomed Ella Marie back in April. Brother Paul (age 2) decided she was a keeper after a short adjustment period. Katy now works out of her home part-time.



Katy Adank '05 with children Paul and Ella Marie.
Photo: Katy Adank



Phil Mooney '07 reports that he built an interactive sandbox for the Sonoma State University geology department after being "inspired" by the one that we built here at DePauw.

Interactive topographic sandbox by Phil Mooney '07.
Photo: Matthew James

Bill Alward '08 continues to work the East Texas Basin (but hopes the pace picks up soon). He also is preparing to take the PG licensing exam. Bill enjoys being a father, and loves spending time with his family.



Bill, Rebecca, and Ansel Alward. Photo: Bill Alward

Charlotte Buehler-Cherry '08 continues to work in Nashville at the Vanderbilt Institute for Global Health, with affiliation with the Division of Gastroenterology, Herpetology, and Nutrition and is focused on infectious cancer prevention and control in Latin America.

Beth Drewes '08 (USGS in Anchorage, AK) reflects back on her time at DePauw, "*Looking back, I am very grateful that I ended up in a geology SRF freshman project and that I was lured to geology even if a trip to New Zealand was what forced me to take intro. I owe the department a big thank you for convincing me to continue on in geology.*"

Lauren Schaefer '09 officially received her Ph.D. from Michigan Technological University-Houghton, MI. Congrats, Dr. Schaefer!

Maggie Baber '11 recently got married and is planning to move to France with her new husband Louis to begin graduate school in Petroleum Geology. Congratulations Maggie!

Cameron Huffman '11 continues to teach Environmental Science at Bishop Chatard High School in Indianapolis and has been busy recruiting students for DePauw. Keep it up Cam, you are doing a fantastic job with them - they're great students!

Julia (Shaw) Sessions '11 received her M.S. at the University of Tulsa (with high honors). She also is a proud new mother of daughter Genevieve, who was born in February. Julia now is now working for Paladin Geological Services and is happy to report "*Work has been very busy and the oilfield seems to be picking back up, even if slowly, so that might make some of your seniors happy.*"

Alex Lopatka '12 writes, "*I'm 4.5 years into the Ph.D at University of Maryland. Collecting data, looking at climate models, and teaching intro geology courses here.*" We look forward to you coming back to DePauw to share your research results...

Kate Welch '12 writes "*I hope you and the geosciences department are flourishing and are going into winter break happy and healthy!*". She is doing well, and hopefully will stop by sometime when she's in the area.

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<http://www.facebook.com/pages/DePauw-University-Geosciences/118662514879623>

Visit our **website:**
<http://www.depauw.edu/academics/departments-programs/geosciences/>



DePauw guests at Madison (Gallegos) Beatty's '13 August wedding, including Katherine Shover '14 and Lauren Van Fleet '16. Congratulations, Madison! Photo: Madison (Gallegos) Beatty

Madison (Gallegos) Beatty '13 was recently named a 2016 Indiana Teaching Fellow by the Woodrow Wilson National Fellowship Foundation. She was one of 43 fellows to receive this award. For more details, please see the following article: <http://www.depauw.edu/news-media/latest-news/details/32466/> She also found time to get married!



Mackenzie Cremeans '14 gathering piezometer data in a stream. Photo: Mackenzie Cremeans

Mackenzie Cremeans '14 returned to the department for an excellent presentation on her Ph.D. work at the University of Kansas. For more information, see <http://www.depauw.edu/academics/departments-programs/geosciences/news/details/171/>

Katherine Shover '14 and **Anna Urso '15** both presented posters at the Lunar and Planetary Science Conference last March. Katherine also got married last fall to Matt Hellmann '13...congrats Katherine!

Ali Sullivan '14 started work this year at the Lewis and Clark Montessori Charter School as a classroom assistant in an upper elementary class.

Henry Binning '15 writes that he is continuing to pursue internship opportunities in the environmental field. Good luck Henry, and we hope to see you again soon.

Steve Dobbs '15 will continue his graduate work at Stanford University this coming fall. He will be working with Tim's former adviser on a Ph.D. there...congrats, Steve!

Makela Elvy '15 notes that she is working for Public Allies in New York City and is thoroughly enjoying her time there. Good to see you and Shibali at graduation!

Alexa Masters '15 is working with the YMCA in outdoor education in Estes Park, Colorado with **Ariana Borrello '14** and loves what she does. Alexa notes that *"if any students are interested in the program feel free to give them my info!"*.

Nicolas McCreary '15 graduated from St. Louis University with a Masters in Sustainability and is actively pursuing the job market in sustainability. Congratulations Nick!

Shibali Patra '15 is working as an Environmental Data Analyst at the Southwest Center for Occupational and Environmental Health at the University of Texas Health's School of Public Health in Houston.

Erin Walsworth '15 writes that she is excited to be back in the Midwest as Sustainability Coordinator at Cook Incorporated in Bloomington, Indiana.

Nick Williams '15 continues to work on his graduate thesis at Northern Illinois University after spending the summer as an intern with Nexen Petroleum in Houston.

Tyler Donaldson '16 has accepted a fellowship for a Master's program at Indiana University-Purdue University-Indianapolis in the Department of Anthropology, where she will be combining her geoscience skills with her expertise in archaeology. Congratulations Tyler!

Lauren Van Fleet '16 recently completed work with Americorps as a park Interpreter at Lava Beds National Monument in northern California and thoroughly enjoyed her time there.



Jeff Winton '87 sent a geo-selfie of himself and Andy Krein '11 from a drilling job in Chicago. Photo: Jeff Winton



Julia (Shaw) Sessions '11 getting a fist bump from daughter Genevieve on receiving her M.S. degree. Photo: Julia (Shaw) Sessions

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