The

Boulder RUNdown

Summer 2022 Newsletter

DEPAUW

Department of Geology & Environmental Geoscience

Cover Photo: Dr. Ken Brown (left) and a few of the students enrolled in the 2022 Winter Term field course "GEOS 183: Field Experiences in the Mojave Desert" taught by Tim Cope and Ken Brown. Photo: Tim Cope

The Year in Review

Scott Wilkerson, Chair

Welcome to the 2022 Boulder RUNdown! Despite the 3-year hiatus in newsletters, your department has been quite busy. In the interim, we have navigated the retirement departures in Spring 2020 of not one, but two department faculty stalwarts (Fred Soster & Jim Mills), the switching from in-person teaching to remote teaching mid-semester in Spring 2020 due to the pandemic, the continuation of first remote teaching and then hybrid teaching through Spring 2021, and then the resumption of in-person teaching (albeit with masks) in Fall 2021 and Spring 2022…all while supporting/ contributing to various university and departmental initiatives in addition to our 'normal' faculty responsibilities involving teaching, research, and service.

Fred Soster and Jim Mills both retired at the end of the Spring 2020 semester, marking the end of an era for the department. Even before the CV19 pandemic, both Fred and Jim requested that the department and the university not hold a retirement gathering in their honor. We honored their wishes, but with the help of many of you, we did compile a book of email letters & pictures from their former students over the years for each of them. While this modest recognition in no way correlates to what these two cornerstones have meant to the department for decades, the old stories, the well wishes, and the testimonies of how they had impacted student lives really meant a lot to Fred & Jim. After the semester was over, we had some socially distanced beers outside at my house to say goodbye. While we all were happy for them and wished them only the best in all of their future endeavors, it personally was very bittersweet as I considered them great friends and extremely valued colleagues… they certainly are (and will be) missed.

Fred and Jim at an overlook in Canyonlands NP, UT with a spectacular view of the canyons carved by headward erosion of tributaries to the Colorado River and of the intrusive laccoliths in the distance. Photo: Lauren Van Fleet

If I had a quarter for every time someone has said how different/strange/unusual the past few years have been, I probably could have considered retiring myself! Clearly, the CV19 pandemic has changed all of our lives to one degree or another. The department was no different, and we faced many new challenges in providing our students a high-quality education, especially given the hands-on nature of our applied labs and our departmental emphasis on field trips and research opportunities. I am very proud of how department faculty (and students) adapted and persevered in the face of these difficulties (e.g., creating 3-D digital models of rock and mineral samples, mapping using Google Earth, ArcGIS, and other digital mapping resources, providing datasets to develop high-quality course-related research projects, becoming adept with Zoom/Google Meet technologies, etc.). Fortunately, many of these assets will provide excellent resources for our classes in the years to come.

We also have been quite busy on many other fronts as well. I'm happy to announce that Ken Brown was hired to a tenure-track position in mineralogy/petrology in the department starting in Fall 2022. Ken was an obvious choice not only for his expertise in mineralogy and petrology, but also for his extensive work on various environmental topics (in addition to his outstanding teaching/research programs and his service both locally and nationally on a variety of fronts, including diversity, equity, & inclusion). Ken has been quite a dynamo since arriving here, even as a term faculty member. He has dedicated many hours to cleaning up/reconditioning the environmental and XRD labs downstairs in the basement to be ready and welcoming for environmental and mineralogy/petrology student projects, respectively (especially now that he has the updated XRD machine fully operational!). He also has worked with Dipson Pradhan '25 and myself to clean up and rearrange the rock room (you'll have to come see it to believe it!).

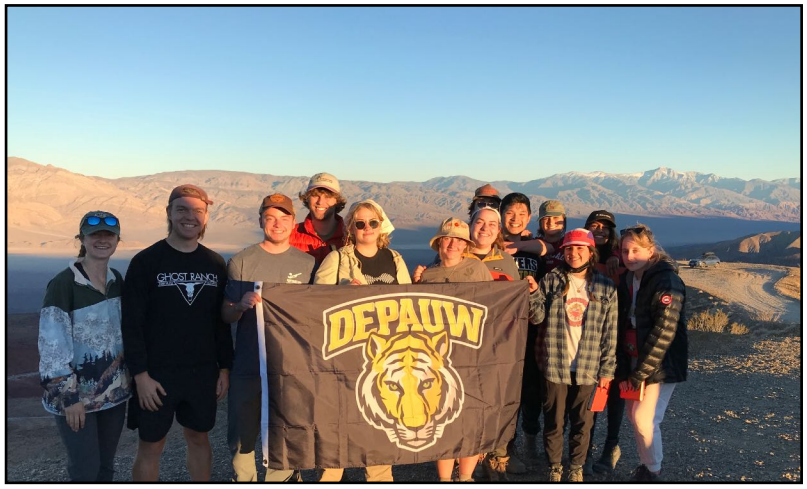
As you probably noted from the cover, we also changed the name of the department from "Department of Geosciences" to the "Department of Geology and Environmental Geoscience" , as part of the overall goal of the university's strategic plan to reinvent/reinvigorate our academic programs. We found that prospective students were a bit unsure about what "geosciences" meant and were often looking for majors pertaining to the environment. Because the vast majority of our majors are geology or environmental geoscience, it made sense to make sure that prospective students could readily find us when exploring what DePauw has to offer. We also have updated our online and local information for prospective majors/students. These updates included revamped hallway displays about career opportunities, speakers/presentations, information on department majors, updated webpages, and 3 digital displays that feature student majors, alumni, famous "Rock Stars" that highlight inclusivity in the discipline, undergraduate research posters, etc.

In part because of these efforts (and despite a couple of years of relatively overall low university enrollments), we are delighted to share that 11 students declared majors in the department in AY2021-22, giving us 23 majors total prior to commencement in May 2022 (11-environmental geoscience and 12-

geology). While it always is bittersweet to say good-bye to our graduating seniors (9 graduates in 2019, 13 graduates in 2020, 7 graduates in 2021, and 8 graduates in 2022), we always look forward to hearing about their exciting post-DePauw endeavors and accomplishments!

Co-curricular activities continue to be a cornerstone of our department. While CV19 hampered our ability to conduct field trips over the past couple years, we continue to offer engaging field opportunities. Specifically, I led a GEOS 350: Structural Geology & Tectonics field trip to Baraboo, WI in Fall 2019 (pre-CV19), and I took GEOS 110: Earth & the Environment classes to Shades State Park in Fall 2019 and then again in Fall 2021. Tim and Jim led a Winter Term 2020 trip to study the fantastic geology of New Zealand, and then Ken and Tim led an epic Winter Term 2022 field trip to Death Valley for "Field Experiences in the Mojave Desert" (see newsletter cover). We really are looking forward to Fall 2022, as we have our fingers crossed that we will be able to start conducting more field trips for our department majors!

Similarly, faculty and student-faculty co-curricular research remained active in the department despite CV19. In Summer 2019, Tim continued to write/refine chapters for his textbook **Sedimentary Geology from Source to Sink**. Scott worked with Zach Wilkerson '20 on an augmented reality project that meshed geology and computer science programming on mobile devices (presented at the annual GSA meeting in Phoenix). During Summer 2020, DePauw did not allow in-person research because of CV19, so faculty developed remote instruction materials for their courses and/or worked on personal research projects. In Summer 2021 research in the department resumed. Ken worked with Peyton Dewaelsche '22, Maggie Keller '23, Abby Cook '22, and Emma Pizana '22 on 3 different petrology & environmental research projects. Tim worked with Lannea Allen '22 and Emily Kaiser '22 on a conodont project in the DePauw Nature Park. Scott developed interactive 3-D models and exercises for a W.W. Norton textbook. Ken also introduced research projects into his intermediate and advanced classes. Many of Ken's summer and course-related research students also have presented/will present their work at undergraduate poster sessions at GSA meetings. We may explore integrating more research into courses in the near



Thanks DePauw alumni for all of your support! Photo: Ken Brown

future…so, stay tuned! Support for all of this work came from several sources including: the **James A. Madison Fund for Research**, the **DePauw Information Technology Associates Program**, the **DePauw Tenzer Visualization Center**, the **Buehler Biomedical Imaging Center**, the **Asher Fund for Undergraduate Science Research**, and the **DePauw Faculty Development Fund**. More details about all of these projects can be found in the individual faculty columns below.

Our ability to continue offering a strong curriculum that is greatly enhanced by these many co-curricular activities would not be possible if not for you. That is, all of these activities cost money, and the Department of Geology & Environmental Geoscience is fortunate to have several endowed funds for research (**James A. Madison Fund for Research**), for field trips (**F. Michael & Dorothy W. Wahl Endowed Fund for Geosciences Field Trips**), and for scholarships (the **Bieber Scholarship Fund**, the **Gault Memorial Fund**, the "**Rock" Smith Memorial Scholarship Fund**, and the **Wylie-Condit Science Scholarship Fund**) that we can draw upon to support our students. Speaking of scholarships, the department awarded merit-based department scholarships to over 40 department majors over the past 4 years (see right). Thanks to all of you who continue to support our geoscience students through your contributions to all of these endowed funds.

If your travels bring you to this area, please consider stopping by for a visit (or a presentation to our students about YOUR DePauw story). Take care, and health & happiness to you and yours! **- Scott**

Department Scholarship Awards

Ernest R. "Rock" Smith Memorial Scholarship

2019: Shelby Lutz '20, Xiaoli Magary '20, & Ben Magnin '20
2020: Hannah Baker '21, Collin Davidson '21, & Kelby Stallings '22
2021: Sarah Bird '22 & Kelby Stallings '22
2022: Katelyn Adams '24, Chris Shannon '23, Kelsang Shrestha '24, & Claire Wolfe '24

Charles L. Bieber Memorial Fund

2019: Bryce Brown '20, Nate Carey '20, Mary Stute '20, Emma Werkowski '21, Cathy Zesiger '21, Sarah Hennessey '21, & Rachel Moore '20
2020: Sarah Bird '22, Peyton Dawaelsche '22, Laura Spasske '21, & Cathy Zesiger
2021: Peyton Dawaelsche '22, Chris Shannon '23, & Will Webster '22
2022: Lauren Cote '25, Dipson Pradhan '25, Angela Ruiz Amaya '25, Quincie Simmons '25, & Danielle Sommerman '25

Charles M. & Frances Wylie-Condit Science Scholarship

2019: Laura Spasske '21 & Joevita Weah '20
2020: Emily Kaiser '22 & Will Roberts '21
2021: Zach Kitchens '23
2022: Maggie Keller '23 & Zach Kitchens '23

H. Richard Gault Memorial Scholarship

2019: Kate Flinn '20
2020: Sarah Hennessey '21
2021: Roma Sukhu '22
2022: Tyler Sucher '24

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

Visit our **website**:
http://www.depauw.edu/academics/departments-programs/envgeo/

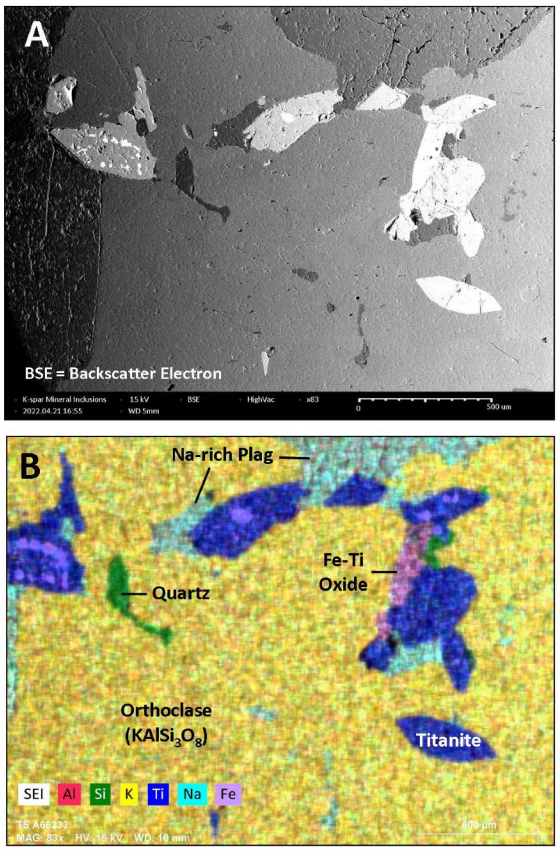
Visit our **Facebook page**:
http://www.facebook.com/pages/DePauw-University-Geosciences/118662514879623

Visit us on **Twitter** (Twitter handle: @DePauwGeo):
https://twitter.com/DePauwGeo

Ken Brown

Greetings! As the department's newest faculty member, I am grateful to return back to my Indiana roots to share my passion for the geosciences here at DePauw University. My geoscience colleagues have been very supportive, and I am thankful for the welcoming environment that they have created. I have to say … it's nice to be "back home again in Indiana".

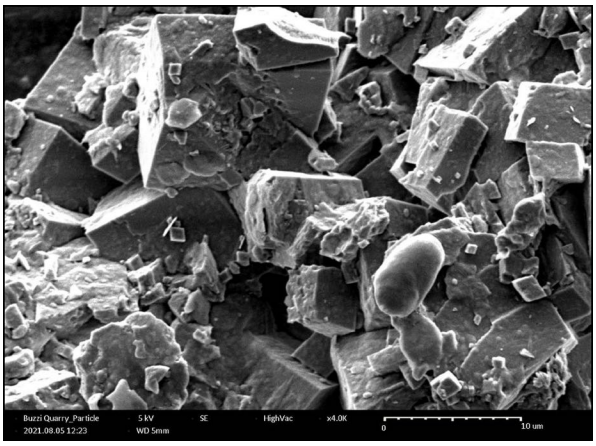
Teaching at DePauw has been great! I've really enjoyed the opportunity to meet so many wonderful DePauw students. Over the last two years, I've continued to integrate research instrumentation into my Mineralogy & Petrology courses. This includes the Scanning Electron Microscope (SEM) and Energy Dispersive Spectrometer (EDS) housed within DePauw's Buehler Biomedical Imaging Center (BBIC) in Olin. Combined, these two instruments are capable of imaging objects less than 1 micron in diameter and collecting qualitative chemical data. This past spring, petrology students were also able to obtain detailed mineral chemistry to support their research projects using Louisiana State University's Electron Probe Micro-Analysis (EPMA). These students were able to present their work during our petrology research forum. We hope to take these projects to the annual GSA meeting in Denver later this year.



SEM/EDS images of an orthoclase megacryst. A) SEM backscatter electron (BSE) image showing megacryst inclusions. B) EDS false color map showing the spatial distribution of megacryst inclusions: Quartz, Na-rich Plag, Titanite, and Fe-Ti oxides. Photo: Ken Brown

Despite the pandemic, I've continued to find ways to work on a broad range of research projects with DePauw students. On the mineralogy/petrology side, I've continued to work on 1) the formation of K-feldspar megacrysts in granites and granodiorites with Laura Spasske '21, Peyton Dewaelsche '22, & Claire Wolfe '24; 2) the magmatic processes responsible for the formation of Icelandic rhyolites with Chris Shannon '23; and 3) investigating distal exposures of the Peach Spring Tuff within the Mojave Desert of

southern California with Kelsang Shrestha ’24. I’ve also been working with Indiana State Museum curator, Peggy Fisherkeller. We have been using the department’s new handheld X-Ray Fluorescence spectrometer (p-XRF) to identify a large collection of mineral specimens donated to the state museum. The original collector of these minerals was a student of René Just Haüy, the famous French crystallographer (referred to as the “Father of Modern Crystallography”). I am excited for this opportunity and look forward to getting DePauw students involved in this project.



Secondary electron image of airborne particles collected from Buzzi Unicem USA plant (<1µm to >10µm). The rhombohedral morphology suggests calcite. Photo: Ken Brown

My environmental projects focus primarily on characterizing urban pollution using soil and street sediments and identifying the presence of asbestos-form minerals in consumer products (e.g., baby powder). In 2020, I created several course-based research projects for my Environmental Geology (GEOS 230) course. Leveraging our new p-XRF, these research projects focused on characterizing and mapping heavy metal pollution (e.g., Pb, As, Cr, Cu, etc.) in soils within Greencastle’s public spaces (Hannah Baker ’21, Kelby Stallings ’22, & Abby Cook ’22). The twelve students that completed the course published abstracts and presented their collaborative research at the Spring 2021 North-Central/South-Central GSA Sectional Meeting. One of these groups created a set of detailed GigaPan panoramic images of outcrops located within the DePauw Nature Park. Check them out: https://www.google.com/maps/d/u/0/edit?mid=16p8WH37N-FC0-r0g_k9u8c64mfaWBgBe&usp=sharing . I also worked with Maggie Keller ’23 and Emma Pizana ’22 on a student-faculty summer research project that utilized GIS spatial analysis to identify, characterize, and quantify the relationships between HOLC map classifications and current environmental hazards found within St. Louis, MO and Chicago, IL.

At the start of the pandemic, Dr. Jim Mills and I were able to acquire a used Scintag X-Ray Diffractometer (XRD) from colleagues in the Department of Geology & Environmental Earth Science at Miami University. Like the p-XRF, this instrument offers an excellent opportunity to greatly expand the department’s research and teaching potential. I have just gotten the instrument operational this summer…so, stay tuned for some cool data!

With Jim’s retirement, I was given the honor of serving as GeoClub faculty advisor. I am grateful to have the opportunity to serve our majors and to help build an inclusive geoscience department through shared GeoClub activities. Although the pandemic certainly restricted our efforts over the past few years, we continue to charge forward with lots of great club events. We are especially

excited about our "DePauw Rocks!" scavenger hunt. From DePauw's famous Boulder to Hoover's garnet augen gneiss floors, this scavenger hunt explores DePauw's rock monuments and dimension stones, giving everyone an opportunity to participate in the geosciences. During the past year, the GeoClub has been very active with Kelby Stallings '22 serving as president. Club activities included the GeoFest mineral and fossil show, pet rock painting, jewelry making, and a guest seminar by Dr. Bruce Houghton (Univ. of Hawaii) regarding the societal impacts of the 2018 Kilauea eruption. We also held a competition for a new GeoClub logo. Our winner was Quan Nguyen '25. Check out Quan's design!

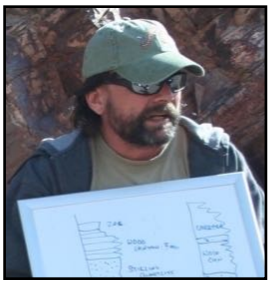
CLUB

New GeoClub logo by Quan Nguyen '25
Photo: Ken Brown

Best wishes – stay in touch and be excellent to each other! - Ken

Spring 2022 Petrology Research Forum.
Photo: Ken Brown

Tim Cope



Hello everyone! It's been a wild three years since our last newsletter. It's hard to believe we haven't put out a newsletter in so long. 2020 began wonderfully. Jim Mills and I taught our last New Zealand Winter Term together in January 2020. We had a terrific time, as always. We had to forgo visiting White Island because of the tragic eruption that had occurred there a month before our visit, killing 22 people. Instead, we changed the itinerary to include some new locations that neither Jim nor I had visited before. In lieu of White Island, we took a wonderful hike over the summit of Mount Tarawera, which last erupted in 1886. We could see White Island off in the distance from the summit. We also visited the northernmost tip of the South Island to map some alluvial Cretaceous and Paleogene conglomerate at Cape Farewell—remnants of the rifting event that opened up the Tasman Sea. And, we spent some time near the steampunk and blue penguin community of Oamaru, which has become my favorite place in New Zealand. One of our students discovered a whisky distillery in that town—to our knowledge, the only one in New Zealand (it is now closed). Jim and I each brought a bottle home. We got a break in the weather to do the Tongariro Crossing.

We returned home just as WHO was declaring the novel coronavirus an international public health emergency. The spring semester began normally enough,

but once the virus started to spread the administration made the wise choice to suspend in-person classes, and soon thereafter to cancel in-person classes for the remainder of the semester following student departures over spring break. We had only a short two weeks to make the transition from in-person to remote instruction. It was a rocky transition for all of us, but fortunately I had some great students that semester—as always!—and we muddled through it together. By the time fall came around, I was much more prepared for remote instruction and my courses went much more smoothly. By Spring 2021, I was still teaching remotely for the most part, with a few in-person labs.

I spent last summer conducting local research with two students who have now graduated. Emily Kaiser '22 and Lannea Allen '22 helped me begin a new feasibility study to extract, describe, and identify conodont fossils in the DePauw Nature Park. For the uninitiated, conodonts are microscopic feeding elements of jawless, primitive, marine chordates similar to a modern-day lamprey or hagfish. They have a variety of fantastic forms reminiscent of something from the move Alien. We set up a lab procedure (in Fred's former basement lab) for extracting the conodonts from the Nature Park limestones that involved crushing and dissolving the limestone in acetic acid, and then picking through the residue to extract the conodonts. We imaged some of our conodonts using the Bueller Biomedical Imaging Center (BBIC) SEM, and with help of our collaborator Alyssa Bancroft at the Iowa Geological Survey, we were able to identify some of them. The project was a great success inasmuch as we were able to demonstrate that conodonts do occur in the Nature Park limestones, but that they are not abundant enough to conduct high-resolution biostratigraphy without a substantially greater number of samples than we were able to collect and process in one summer. My students and I also began experimenting with drone-based mapping and 3-D photogrammetry. I obtained my UAV pilot's license, and have been using a DJI Phantom drone to map the DePauw Nature Park and the Ullem Campus Farm in 3-D. I am also continuing to work on my work on my sedimentology/stratigraphy textbook, entitled **Sedimentary Geology from Source to Sink**, and hope to complete it this year.

Tim teaching in Death Valley near a major fault breccia on the "Field Experiences in the Mojave Desert" 2022 Winter Term field trip. Photo: Ken Brown

This past year meant a long-awaited return to teaching in-person. Aside from the slight inconvenience of last year's necessary and mandatory mask-wearing (I've found it's difficult for my students and I to recognize each other without a mask!), it's been great to return to the classroom. And I dove into it. I taught four courses in-person during the fall (including a first-year seminar), two more last spring, and last January (with Ken Brown) taught an off-

campus Winter Term to the Mojave Desert. Although the Omicron variant threatened briefly to derail our plans for the trip (two students came down with CV19 and had to be quarantined), we got very lucky and contained the outbreak. We completed a multi-day mapping project in the Marble Mountains, camped in Death Valley, toured Joshua Tree National Park and the San Andreas fault, traced the California Aqueduct through the desert, and mapped the Spring Mountain foothills west of Las Vegas…altogether, a very successful trip!

Tim and Kelsang Shrestha '24 in the field in Death Valley, CA. Photo: Ken Brown

My family and I have been extremely fortunate to have stayed healthy these past three years. Zoe is now 14 and Tess is 12. Both of them have become fantastic artists. We are currently working on a family project to transform my old Tacoma 4WD pickup truck into an art car. So far, the hood and one door are complete, with more to come. Kate is doing great. She has been working from home as an online career coach and taken part in a number of community service projects in and around Greencastle. We spent most of 2020/2021 huddled together at home, but have managed to get out of the house for short vacations to see Kate's family in New York and mine in California.

Please drop me a line sometime—it would be great to hear how you're doing!

- Tim

Tim and Hannah Buchanan '22 with the scaled GeoWalk geologic time scale display for ArtFest '22. Photo: Scott Wilkerson

100th (1921-2021) Department Anniversary Celebration

Department of Geology (1921-1948)
Department of Geology & Geography (1948-2003)
Department of Geosciences (2003-2022)
Department of Geology & Environmental Geoscience (2022-present)

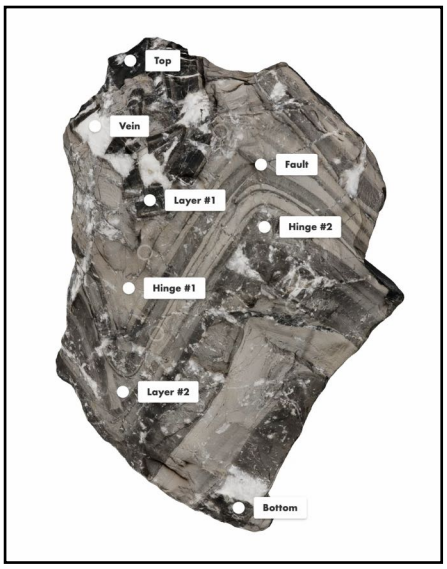
2021 was a momentous year in the department's history as it marked 100 years since the Department of Geology was established in 1921 by Ernest R. "Rock" Smith. Unfortunately, because of the CV19 pandemic, we could not host a celebration of the department's centennial anniversary in 2021. However…AY2022-23 marks the beginning of the next century for the department, and anniversaries are meant to be occasions that not only look back over the years, but that also look forward to the many great things to come!

With that in mind, we are considering hosting an anniversary celebration here in Greencastle during Alumni Reunion Weekend (June 8-11, 2023). We hope to announce more concrete plans next January (as we'll also have a better handle on the CV19 pandemic status at that point), but for now, it would be incredibly helpful for planning to know roughly how many people might come (and to compile an email list for folks interested in additional details).

Please respond using the following link or QR code: https://bit.ly/3yxw3h4

Scott Wilkerson

Greetings…I hope that you all are doing well! Summer is upon us, and I find my time divided between wrapping up tasks that remain from the academic year and making progress on various new and exciting fronts. While I just finished my most recent stint as department chair (Tim took over the reins of the department on July 1), I will continue serving DePauw in my role as University Marshal (in addition to my regular academic duties).

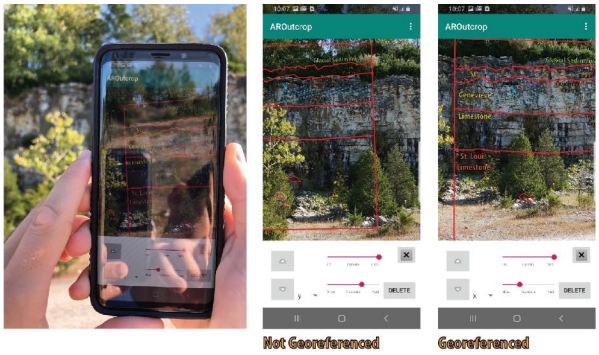


3-D digital model of folded Precambrian limestone with structural features labeled. Photo: Scott Wilkerson

On the teaching front, the past few years have been quite busy. I continue to explore different ways of visualizing various geologic features and processes in my classes. My interest in 3-D photogrammetric models and ESRI story maps served me well during the pandemic as I developed ~75 3-D digital models of rocks and minerals and another ~45 models of geologic specimens highlighting various geologic features for the GEOS 110: Earth & the Environment course (see https://www.depauw.edu/academics/departments-programs/envgeo/cool-geoscience-resources/3-d-geologic-models/). Many of these models also found use by middle-school, high-school, and college teachers across the country in their courses, and some were published in most recent **Essentials of Geology** (7th edition; W.W. Norton) textbook by Stephen Marshak.

On the research front, Steve Marshak and I literally just submitted a manuscript explaining how the perplexing down-dip-verging, second-generation folds and crenulation cleavage developed during the formation of the regional Baraboo Syncline in Wisconsin. We think our interpretation not only explains these enigmatic structures, but may also help others re-interpret these complex structures in other orogenic belts. In addition to this research, I also worked with Zach Wilkerson '20 over the summer on **AROutcrop** (Zach is my oldest son). Using their mobile devices, students can interact with various AR objects by automatically (using photo recognition) overlaying & georeferencing (e.g., resizing, translating, rotating) a 2-D AR geologic interpretion over the outcrop to highlight specific features and/or rock layers and/or collecting a "rock sample" by placing a 3-D AR model of actual rock specimen on the ground, etc. (see photo). Zach presented this work at the 2019 GSA annual meeting in Phoenix with a poster entitled *AROutcrop: An augmented reality mobile application for teaching geology in*

the field. It was awesome working with my son Zach on a research project, and we hope to submit a "Wilkerson & Wilkerson" manuscript on this work in the relatively near future. Finally, last summer I obtained my UAV/drone commercial pilot license (as did Tim), so I'm currently working this summer using drones and 3-D photogrammetry to create 3-D digital models of entire outcrops…so, stay tuned!



AROutcrop mobile app uses outcrop photo recognition to select and project augmented reality (AR) interpretation, which can then be georeferenced with outcrop. Photo: Scott Wilkerson

On the home front, things remain busy. Ben (20) is now a rising junior at DePauw. He is majoring in computer science with probable double-minors in physics and math. This summer he is currently working on programming touch-screen applications for the Tenzer Visualization Center. In his spare time, he serves as assistant coach for the Greencastle High School boys soccer team. Zach (24) graduated from DePauw in 2020, and was one of three Murad Medal finalists his senior year. He just finished his second year in graduate school at Indiana University (working towards his Ph.D. in Computer Science with a specialty in artificial intelligence). He has the bulk of his coursework behind him and has two manuscripts on his work published. Beth continues to support various constituencies at DePauw with her GIS work (among other faculty support endeavors through the GIS Center). She continues to hone various programming and visualization skills, including working with me on photogrammetry projects.

Wilkerson family at Turkey Run State Park. Our newest family member is Canyon, our "purple heeler" pup (red/blue heeler mix). Photo: Scott Wilkerson

I hope that 2022 brings health and happiness to you and yours...please stop by if you are in town and/or drop me an email update!

- Scott

Jim Mills

professor emeritus

Hi all! 2019, 2020, 2021, and 2022... Really? It seems like Tim, me, and some of you were just returning from another wonderful trip to N-Zed. Must be doing the Time Warp again (which I would guess, for many of you, the “time warp" cultural significance is hazy at best unless of course you are now a connoisseur of recent Airbnb commercials or a particular Tim Curry movie).

But in all seriousness, it **has** been a long time, and I hope this newsletter finds you, your partners, your spouses, your family, and your friends all well. And yes, I did promise to respond to all of you that contributed to the incredible, wonderful, and heartfelt booklet that Scott had so carefully and thoughtfully prepared from your submissions for Fred and me (and for those of you that couldn’t, *thank you* for all the notes you have sent!). I started to reply a few times, but as usual, life and a significant case of procrastination has overtaken that effort. However, I *promise* you will hear from me! If your e-mail has changed since 2020, please send me an updated address (my DePauw address will remain active for a very long time: jmills@depauw.edu).

Retirement, as many other retired people say, has been just as busy (sometimes more!) than working. A new house (a 1911 farmhouse actually) in the northern Michigan woods, projects, hiking, boating, fishing, kids (two of the three live up here too!), a grandson, a 1600 ft^2 vegetable garden, shoveling the ever-seemingly-present snow, and two cats keep me plenty busy. Life hint... beware buying a house with a bakers-dozen 120-200-year-old oak trees around it – I have never seen SO MANY (add an expletive or two) acorns in my life... all of which, want to sprout into new oak trees!

I am working on a project with Drs. Rebecca Schindler (principal investigator) and Pedar Foss (both in the Classics Department) on the petrography of ceramics recovered at their archaeological dig in central Italy located west of Lago Trasimeno. The site hosts what appears to be a very, culturally significant, ~2000-year-old Roman villa. I have a fabulous Nikon petrographic scope set-up in my office to do the petrographic work. but miss having the ‘ol Rock Room to work in! Lots of thin sections to look at....!

I am amazed from conversations, and from information in this newsletter, at just how much effort and work Scott, Tim, and Ken have, and are, putting in to keep the Department in tip-top shape (above and beyond what they were already doing before Fred and I retired). Congratulations all! And, I am so pleased to know that Ken has done a *magnificent* job in his role as the new Mineralogist/Igneous Petrologist/Environmental Scientist (and congratulations on receiving the tenure-track position, Ken!).

Take care, be safe, congratulations to all of the alumni on your accomplishments, and thanks to all for 27 years of wonderful memories (and Mexican dinners - wink, wink...)! Stay in touch! **- Jim**

Fred Soster

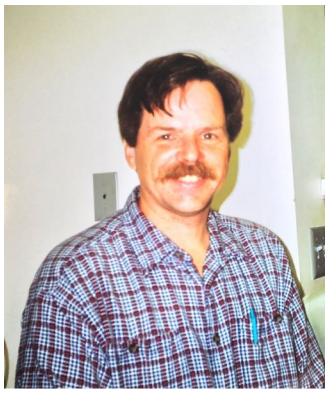
professor emeritus

Greetings from the Blue Ridge Mountains in North Carolina! As you probably know by now, I retired from DePauw University in June 2020 after 37 years of teaching. The last semester was very strange because of the CV19 pandemic. The university was shut down, students were sent home, classes were being taught remotely, and the graduation ceremony was cancelled. Not exactly the way I had envisioned ending my time at DePauw. The Wilkersons hosted a small outdoor get-together at their home for Jim Mills (who also retired) and me where we said our final goodbyes. Scott gave each of us a book of letters and photographs from many of our former students that he had compiled. I did not even begin to fathom the impact that my teaching had on so many of you until I began reading the letters that spanned nearly four decades. These have had a deep impact on me. Thank you all for your kind words and best wishes. I was very fortunate to spend my entire career at DePauw. Jim, Scott, and Tim were great colleagues and friends, and I worked with great students who went on to do amazing things.

Jennifer and I now reside in the unincorporated town of Leicester, which is about 9 miles northwest of Asheville, NC. We had purchased some land in 2018 and were planning to eventually build a house when we retired, but DePauw offered a generous retirement package, so we both retired earlier than planned. We built the house, and we moved down here in August 2020. We spent the first year getting settled in and most of the past year finishing our basement (doing most of the work ourselves). Jennifer couldn't stay retired for long and landed a job last year at Warren Wilson College where she is the executive assistant to the provost. I underwent double knee replacement surgery in May, so I have been sidelined this summer learning how to walk again with new knees. It's been a long recovery, but I am making good progress and should be back on the hiking trails in August.

Our daughter, Erica, still works for LapCorp in Indianapolis and is expecting her first child in July. Our son, Frederick, is working on a Ph.D. in meteorology at Florida State. We also have a new member of the family: a dog, Festus, who is three years old. He is a shepherd/husky mix who we rescued from a local shelter when he was a year old. If your travels ever bring you down to Asheville, let us know. We can meet up for beers at one of the local breweries. I still have my DePauw email address (fsoster@depauw.edu). Stay safe and be well. **- Fred**

Fred & Festus. Photo: Jennifer Soster



Jim and Fred through the years. Many of you have participated on some of these field trips (and a few of you may have even heard "I smell outcrop!!!" once or twice). Photos: Various students & faculty

Alumni News

We greatly appreciate everyone who has reached out to the department with updates on your lives, families, careers, etc., as well as job openings and internship opportunities. We undoubtedly overlooked some emails, so please accept our apologies in advance! We would love to hear from you, so please continue to send us emails and/or stop by when you are in the area.

Dr. Katherine (Kit) Price Blount, former faculty member in the department, passed away on February 5, 2020. Her obituary can be read at https://www.legacy.com/obituaries/batesville/name/dr-katherine-price-blount-obituary?id=8653251

F. Michael Wahl '53, department alum and benefactor of the **F. Michael & Dorothy W. Wahl Endowed Fund for Geosciences Field Trips**, passed away on December 6, 2021. His obituary can be read at https://www.gainesville.com/obituaries/pgai0120240

Jim Puckett '53 regularly touch bases with the department with information about geoscience exhibits at his local museum, with a donation for the department, and/or to visit with Jim Mills when he comes to Colorado.

Mark Boling '79, founder and CEO of 2C Energy (https://2cnrg.com), visited DePauw in April 2019 to give a series of talks centered on low-carbon energy solutions to help address the challenges of climate change. Mark's work focuses on sustainable energy practices that maintain economic growth, enhance energy security, and provide energy to underserved populations worldwide. Mark shared some remarkable work that he has done in Malawi, Africa as well as a special presentation for the department on the subsurface risk associated with hydraulic fracturing operations.

Chris Herin '84 works for Geosyntec in Boca Raton, FL. Chris shares that Geosyntec frequently has job openings and regularly sponsors a student writing competition. On a related note, Megan Martz, who works in the Geosyntec Indianapolis office, recently hired **Nick Williams '15**.

John McInnes '89 works for Stantec in Indianapolis, IN. John has hired several department alums over the past few years. He writes, "*I am always comfortable making a DPU hire because they reliably exhibit superior writing and critical thinking skills.*"

Katie Farnsworth '93, associate professor in the department of geoscience at the Indiana University of Pennsylvania, was the recipient of the 2018 Evergreen Award from the Evergreen Conservancy (a nonprofit working to advance the preservation, protection, and stewardship of natural, cultural, and historical resources in and around Indiana County in PA).

Chris Bonniwell '94 recently started Vapor Products Group, a company in Cedarburg, WI that specializes in manufacturing the Vapor Sentinel and Radon Sentinel product lines for the radon and soil gas intrusion/mitigation industry (https://www.vaporsentinel.com). Chris has been great to make himself available for presentations to department majors on environmental issues.

Tony Gibson '99, Rick Wachtman '99, and Scott enjoying an impromptu reunion in Greencastle this past April. Photo: Rick Wachtman

Tony Gibson '99 is as busy as ever with several different businesses….Murvin Oil (Illinois Basin oil production), Meat Artisan (an awesome online meat shop https://meatartisan.com), and Niche Trends (business lead generation https://www.nichetrends.com). We're hoping that his daughter Megan follows Dad's footsteps to DePauw!

Rick Wachtman '99 was back in the area this past April and arranged to rendezvous with Tony Gibson '99 and Scott in Greencastle (see photo). Rick has served in a wide range of roles at ExxonMobil in Houston for over 20 years now. Rick married a geologist and has two young girls (Lucy and Annie…more DePauw geologists?).

Jennifer (Berry) Phillippe '01 is now a physical scientist with the US Army Corps of Engineers in Seattle, WA.

Chris Amidon '02 is the Supervisory Park Ranger for Isle Royale National Park in Houghton, MI. Chris has given two virtual presentations to the GEOS 107: Geology of America's National Parks classes on Isle Royale and some of his caving activities at other national parks. Chris and Erin are doing well as are children Tess, Nigel, and Gwen.

Keith Herrman '05 relocated back to Arlington, VA from the Indianapolis area where he now is a real estate broker at Keller Williams Realty, Inc.

Mark Loomis '06 remains busy as ever working for the EPA Great Lakes Program. He sent us a Christmas card with pictures of his lovely family.

John Musselman '06 lives in the northern Arizona area and has been involved with teaching skills with a deep nature connection.

Ben Clement '07 is an associate geologist for Burns & McDonnell Environmental Services in St. Louis, MO. Ben regularly checks in with the department when there are job openings in his company…thanks!

Keith Schonberger '07 shares that he graduated in 2019 with a Master's degree in Petroleum Geology from the University of Houston (see photo). Keith is an upstream capabilities geosteering specialist at Chevron in Houston, TX.

Kyle Smitley '07 received the 2019 DePauw Young Alumni Award.

Keith Schonberger '07 earned his M.S. degree at the University of Houston.

David (PJ) Della Chiesa '08 is now Vice President of Sales & Marketing for Stryker Drilling in Pittsburgh, PA after a long stint with Halliburton. PJ shared that he still leverages his geology knowledge as he works with his clients in business development.

Beth Drewes '08 is still working for the USGS in Alaska on a combination of projects ranging from mapping igneous petrology in remote areas to serving as archivist and outreach coordinator. Erin and Beth welcomed Charlotte Todd in Nov 2018, followed by large earthquake with aftershocks two weeks later! Charlotte also enjoys picking up rocks…with that hobby and the earthquake, she is destined to be a geo-major (send her to DePauw!).

Nick Vetz '08 currently lives in the Salt Lake City area and works for Rio Tinto as a geologist at the Bingham Canyon mine (before that he worked for Barrick Gold in Elko, NV). He has been investigating underground tunnels that date back to the 1870's as well as mapping open pit geology with drones and 3-D visualization. Nick says that they often have summer internships available for students.

Nick Vetz '08 with his daughter (left) and dressed for field work (right).

Julia (Shaw) Sessions '11 continues to work in the Oklahoma region after earning her M.S. in Geosciences at the University of Tulsa. It sounds like daughter Genevieve is keeping her and Nephi busy!

Jason Blasdel '12 is now a project geologist with Stantec, an environmental company in Indianapolis.

Alex Lopatka '12 writes that he defended his Ph.D. at the University of Maryland in April 2018. Since then, he has been working at Physics Today writing articles and now is associate editor. Alex shares, "*I've covered quantum computing, weather forecasting with AI, the Atlantic overturning circulation, and right now I'm working on a story about pyroclastic flows that ride on a layer of friction-defying air. The DePauw geoscience education has been quite helpful when reading new literature and editing the feature articles of scientists. I'm constantly going back to basics and having a solid foundation has been invaluable.*"

Kate Welch '12 received her law degree from Stetson University College of Law (where she was President of Stetson's Environmental Law Society!). She now is an attorney at the Lee County Sheriff's Office in Fort Myers, FL. She mentions in her email (regarding a case that she worked on as a law clerk) to Fred how "*It was helpful to my complaint that I did research on Lake Erie hypoxia with you all those years ago!"*. Kate (and **Mackenzie Jones '18** and **Joevita Weah '20**) served on a DePauw Alumni Panel this past spring to describe the many things that one can do with a major in geology, environmental geoscience, or earth science.

Greg Screws '13 is now an environmental scientist with Tetra Tech in Rancho Cordova, CA.

Ariana Borrello '14 recently graduated from the University of Colorado-Boulder's Master of the Environment (MENV) program with a specialization in urban resilience and sustainability. She is "*working part-time for Nature-Based Climate Initiatives (part of the Urban Sustainability Directors Network) as a graduate consultant and project manager for municipal natural climate solutions projects.*"

John Strubbe '14 is a senior geospatial analyst at Axim Geospatial in Arlington, VA. Along the way to his present position, John earned a GIS certificate and "*…did a lot of work with lidar and high resolution orthoimagery for the Army Geospatial Center.*" John also writes, "*I know I was worried if I knew enough when I graduated but the department did such a good job not only teaching material but also preparing us for the professional world. I cannot tell you all how grateful I am to have had geo professors that went the extra mile.*"

Nick Williams '15 is now back in the Indianapolis area working for Geosyntec. Nick worked with Mark Fischer at Northern Illinois University for his M.S. degree and recently published a paper on his work (*Structural evolution and deformation near a Tertiary salt weld, Willouran Ranges, south Australia* in Marine & Petroleum Geology, 2019 https://doi.org/10.1016/j.marpetgeo.2018.12.035)

Kojo Addaquay '16 has been incredibly busy. He is working on his M.S. in Information Systems at Northeastern University in Boston, is the technical lead/software engineer for Fluid Finance Technologies, and was co-founder of forward studios (web page design firm for clients across Ghana, Sierra Leone, & U.S.).

Alex Ruger '17 shares that he is working at the Black Hills Institute of Geological Research and loving it! Those of you who know Alex know that this is a dream job for him…he'll not have to work a day in his life there!

Peter Steiner '17 writes that he has completed most of his Ph.D. coursework at the University of Georgia and is transitioning to thesis work involving "*…understanding nutrient cycling and the role of soil mineralogy in those processes.*" Peter shares "*It's so great to hear about the fun and insightful experiences all of you are still providing the new students coming into the department after us, and to remember being on many of these experiences myself.*"

Genna Chiaro '17 received her M.S. from Vanderbilt University on understanding the pre-eruptive architecture and magmatic processes of supereruptions in Italy. In her acknowledgements, she gave a shout-out to Tim

and Jim Mills, "*I'd like to extend a huge thank you to the professors I had in undergrad, specifically Tim Cope, Jim Mills, and Beth Pratt-Sitaula. I cherish the memories I had being in your classes and in the field with you all.*" Genna is currently working on her Ph.D. at Vanderbilt.

Elise (Johns) McMurtry '18 is an associate brand marketing manager for Newell Brands in Chicago, IL.

Mackenzie Jones '18 is now an environmental program assistant with the City of Folsom in CA.

Logan LaCross '18 is a geologist with Parsons Corporation in Midland, MI.

Matt Dauw '19 reports that he is now a geologist with Terracon in Denver, CO. He is applying for graduate schools where he can remain working at Terracon and still make progress towards an M.S. degree.

Vy Le '19 is a graduate student (M.S. & Ph.D.) in Geoscience (Hydrogeology/Biogeochemisry) at the University of Wisconsin-Madison.

Danielle Smith '19 is now an M.S. graduate student at Tulane University's Master of Management in Energy program. This summer, Danielle is an analyst for Marathon Capital in Chicago.

Bryce Brown '20 recently graduated with an M.S. in Geology from New Mexico State University (with a Geology paper to show for some of his work!). Bryce has moved back to the area to be a geologist for the Indiana Department of Natural Resources - Division of Reclamation in Terre Haute, IN. He also shared that he and his wife are expecting in February…congratulations!

Nathan Carey '20 shared that he was teaching two structural geology labs at the University of Nevada - Las Vegas. He writes, "*I am realizing how lucky we were to have had a group of faculty that cared about their work and truly helping students learn…*". Nathan adds "*Anyway, I now truly understand the benefit of a small school learning environment such as DePauw. I am very grateful for the experience I had.*"

Shelby Lutz '20 is working for SJCA in Indianapolis as an environmental scientist/ ecologist. She will have the opportunity to assist in archaeological excavations and help out with GIS.

Ben Magnin '20 continues to do well at the Colorado School of Mines. Ben started as an M.S. student, but is now working towards his Ph.D. This summer he is working as a field geologist for the Colorado Geological Survey, but will be working for the USGS by July. Ben writes "*I wanted to send an email thanking you so much for doing such a great job preparing us in structural geology! I'm currently in advanced structure and the whole first half of the semester has felt like review, while it has been new for most others.*"

Ben Magnin '20 and Nathan Carey '20 at the GSA annual meeting in Portland, OR.

John Rawlings '20 took a field technician position for an environmental remediation group (Action Environmental) in Nashville, TN.

Collin Davidson '21 is a hydrogeology & water resource management graduate student in the M.S. program at University of Nevada - Las Vegas. This summer Collin is a hydrology intern at Bryce Canyon National Park with their Scientists in the Park program.

Sarah Hennessey '21 is now studying invertebrate paleontology for her M.S. at Ohio University. Sarah also showcases her artistic talents at https://www.etsy.com/shop/TheFloralFossil .

Geo-major cookout at the Wilkerson house. Inset: Tim blindfolded while playing the "How Well Do You Know the Department?" game. Photo: Scott Wilkerson

One of the Fall 2021 GEOS 110 lab sections exploring the geology of Shades State Park (many of these folks are now geo-majors!). Photo: Scott Wilkerson

DEPAUW
Department of Geology & Environmental Geoscience
2 E. Hanna Street, Greencastle, IN 46135