

UGA Geology News – 2021

Welcome letter Summer 2021

Greetings from the Head's office! This past academic year has been remarkable. I do not intend to minimize the impact of the pandemic, because it has assuredly altered the world as we knew it and my sincere concerns go out to all that were affected. The great news is that the Geology department has maintained an amazing amount of productivity despite the challenges. I'll begin with myself by noting that all three of my graduate students successfully graduated with thanks to the VP of Research, Dr. Lee, who authorized research resumption plans for Laura Fackrell, Peter Steiner, and Huseyin Demir. Laura and Peter had live culture experiments and Huseyin maintained essential lab functions for the Geology department. I chaired a search for the new director of the Center for Applied Isotopes, who you may recall was started by Dr. John Noakes from Geology. The new Director is Dr. Carla Hadden. Doug Crowe served valiantly as interim CAIS director, where in addition to transforming its business and operating structure, he also brokered a new memorandum of understanding to establish a new shared sample handling facility. This is located at the Horseshoe Bend facility; long operated by Ecology on the east side. Consolidation of grinders, saws, mills, and crusher equipment will compliment other commonly used sample processing tools by CAIS, Anthropology, and Ecology. The mission of CAIS now includes research assistantships, some of which are going to Geology graduate students. We will be keeping basic rock preparation facilities in the G&G building.

Speaking of searches, as of July 1, 2021, Michael Durham will be hired as a full time Laboratory Professional. Many you know of Michael, who was part of Adam Milewski's Water Resources Group. Michael will be helping with safety and compliance issues, aiding with Field Camp, our website, and the collections (and many other aspects of the day to day operations).

Our virtual awards program for the past academic year covered a lot of accolades and serves as a good snapshot of our accomplishments (<https://geology.uga.edu/departamental-awards>). We began by recognizing the UGA Geology Alumni Advisory Board, who met virtually on the same day. Grant Eager is the new Chair making plans to return to face-to-face activities such as a Geology alumni reunion next year with the aim to dedicate the newly named Gilles Allard Petrology lab. Gilles attended the awards program from his room at Arbor Terrace (AT) in Athens. Feel free to contact Gilles as he loves to accept visitors (you'll need to call ahead to AT to schedule). Gilles is fine tuning his memoirs with the help of his daughter.

We recognized 15 undergraduates graduating with a B.S. degree. Some still needed to fulfill the field camp requirement this summer. Kudos to Christian Klimczak, Doug Crowe, Adam Milewski, and Andy Darling who transformed field camp to an Athens-based operation. A trip was made to Woodall Shoals, SC (see photo).



Unprecedented access was made to Grave's Mountain, where student mapped and conducted water testing exercises (see photo). Drone surveillance mapping has been introduced to the field curriculum, which is now an essential skill set used by most all geologic enterprises. From our undergrad cohort, we also had 7 majors participate in directed research studying topics from sharks teeth to cosmogenic nuclides to wildlife refuge hydrology to fossil Cretaceous oysters.



Undergrads also presented at conferences, albeit virtual ones. Three Ph.D. and seven M.S. students completed their studies, with most already moved on to future careers in the geosciences. Graduate student efforts collectively resulted in 11 publications and 18 presentations at meetings. External funding was received by 5 graduate students, with funds coming from GSA, Sigma Xi, and the Paleo Society. These numbers are impressive, particularly in a year where pandemic restrictions created a current that we were all swimming against. Congrats go to Rob Hawman and Adam Milewski, who were recognized as Teacher of the year and Professor of the year, respectively. We were also proud to acknowledge Sally Walker in the first year as a named Professorship to the Geology Department. As I understand, Sally used her Shellebarger Professorship resources to promote undergraduate research.

This year the faculty voted to award Peter Lanzarone as one of our UGA Geology Outstanding Young Alumni and Margaret Frasier as one of our UGA Geology Distinguished Alumni. Margaret joins other Distinguished alum that include Hap McSween, who was elected to the prestigious National Academy of Sciences this year.

We closed our awards program with staff accolades. I will not sugar coat the situation. Yes, times have changed. I recall when I arrived to UGA, Geology had 5 office staff people. It has been a challenge now, with only two office people; Rachel Ashton and Ashley Arnold. They are truly the glue that holds the department together and what makes the Geology department a community. They navigate the complexities of our missions in research, teaching, and outreach. They direct undergraduate workers. They keep our grant budgets in order. They manage the classrooms. They care for the student programs of study. They keep the vans and copiers running... and the list goes on. Next time you see them, give them a big thanks.

Each year the Dean Alan Dorsey reviews all the units in the Franklin College of Arts and Sciences (of which there are 60 units!). Perhaps one of the greatest compliments that the Dean gave upon the review is that he noted Geology was one of most productive units during the pandemic. In addition to my response of saying "thanks", I told him it was the collective passion and dedication of the Geology staff, students, and faculty that reflected that outcome. Dean

Dorsey is ceding his position at the end of next year, so some changes will be on the horizon, with hopes the new Dean will be equally supportive of our mission.

Here are few faculty highlights

In addition to Doug Crowe being interim director of CAIS, he has continued to champion our fund raising effort and the curation of our outstanding Allard economic mineral collection. The collection database is a vast and rich resource for all, with new specimens expanding well beyond its original intent. Mineralogists from around the world can now access the information and specimens, many of which are now uncollectable because the sites have been reclaimed.

Andy Darling is now teaching the Dinosaurs course, which has a huge interest (and enrollment). This is in addition to the Earth Sciences Middle Grade education course, for which we see as very important to the next generation of teachers. At the same time, Andy has been collaborating with the NSF Critical Zone Observatory research cohort on using cosmogenic nuclides to study rates of erosion and impacts of land use on geomorphic landscape evolution. The accompanying photo of Andy is of him sitting at the head waters of the Holcomb's Branch in the Calhoun Critical Zone Observatory in the South Carolina Piedmont after sampling stream sediments for cosmogenic study.



Charlotte Garing now has her multiphase microporous media laboratory operational with her grad students. She is collaborating with an NSF funded project that explores hydrologic transmission losses in dryland environments in places like Morocco. In addition to teaching a summer geology course, Charlotte is settling into a new home and now enjoys the all the new benefits (and headaches) of ownership.

Erv Garrison is shepherding a new NSF project to assess the potential of scour nuclei for the discovery of submerged prehistoric archeological sites on the inner- to mid-continental shelf in the Georgia bight. He'll be wearing a path between Athens and the GA Coast, hopefully with some new and exciting discoveries about how humans may have influenced the now submerged ancient Coastal Plain. Erv's protégé, Jessica Cook [published an exciting find](#) that shows submerged shell middens offer a rare insight into the lifestyles of First Native people and the history for how past coastal communities were utilized.

As mentioned above, Rob Hawman was voted as the Teacher of the Year, which is becoming almost a perennial outcome. It is no coincident that Rob's teaching is recognized by this honor, but yet impressive by any means considering that all the Geology faculty take great pride and put great effort into their teaching. Rob remained remarkably engaged with his research. He published a paper in the highest-impact journal in his field, *Geophysical Research Letters*. This paper examined the nature of the southern Appalachians and Atlantic Coastal Plain

using seismic signals generated by earthquakes from select locations on the opposite side of the Earth. This work was in collaboration with four of Rob's graduate students.

After two decades of focusing on the stratigraphic paleobiology of marine systems, Steven Holland and the UGA Stratigraphy Lab are turning their attention to nonmarine deposits and their archives of land plants and vertebrates. They are developing computer simulations of the nonmarine fossil record, which let them formulate hypotheses that they are testing in many field areas including the Miocene of southern California, the Triassic and Jurassic of central Wyoming, the Cretaceous of Montana and North Dakota, and the Carboniferous of the southern Appalachians. The photo shows Elliot Blake, Max Deckman, Katie Loughney, Anik Regan, Samantha Khatri, Steven Holland on Log Rock at Kingdom Come State Park near Cumberland, Kentucky. They will be using the summer to get back in the field.



Christian Klimczak co-authored four peer community white papers with well-known international scientists. These papers cover a wide range of recommendations and posit challenging questions related to planetary science and astrobiology focusing on Mercury-related science and mission support. Now that he is promoted and tenured, Christian is further embracing research related to landforms on Mars, Mercury and the Moon. His grad student Isik Yazici completed her M.S. study of Mercury impact fracture patterning and is starting a Ph.D. program in Germany. The photo shows Isik, along with Huseyin Demir, and Laura Fackrell upon confirmation of their degrees. Christian led the summer Geology Field camp, which was run from Athens. As noted above, he became a master of "preparing to pivot" and further oversaw the planning and implementation of field camp exercises based in the S.E. Piedmont. We are sure he looks forward to the return to Colorado, where the landscape is sans Kudzu. Check out the news item on Christians receipt of the [M.C. Michael Award](#).



Adam Milewski was unanimously recommended and promoted to full Professor this summer. He is managing five grants, funded by the NSF-IRES program, the U.S. National Park Service, two with the National Fish and Wildlife Service, and the U.S. Department of Interior.

Along with his grad students, Adam is using these grants to study hydrologic controls on transmission losses in drylands, coastal salt marshes, landscapes in the S.E. U.S., agropastoral decisions making in response to climate change, and water resource inventoried in national wildlife refuges. Adam continues to serve as an invaluable asset in his role as Associate Head, where he coordinates the teaching schedule and is a great sounding board for the Head as we navigate the challenges of new order in the pandemic world.

Valentine Nzungung's scholarly activities were reflected in his continued acquisition and management of extramural funds, where he is a co-investigator with the NSF sponsored UGA I-Corp program, which has the mission to accelerate the commercialization of new technologies, products, and processes that arise from research. The research program Valentine established with Duke Energy continues to examine methods for immobilizing metals and non-metals in coal combustion residuals, which is proving to be quite effective both in terms of lowering industry costs and providing environmental benefits. He continues to receive high-profile notoriety for making the world a safer place with his MuniRem invention and the Geology Department continues to receive royalties from his sulfur-based bulk reductant patent. He developed a new course in Agrogeology, which was well received by the students and they explored new topics that tie together traditional knowledge in geology with concepts in agronomy.

Marta Patino-Douce is one of our most capable teachers in terms of working in the large class environment. The pandemic impacted her teaching, as it did with all teaching staff, but to her credit, she spent the summer preparing to teach online and got additional training by taking the course "Preparing to pivot" from the UGA Center of Teaching and Learning. Marta was able to update all of her course visuals and continues to lead the offering of the electronic course GEOL1011K, Introduction to Geosciences I, which satisfies part of the USG Board of Regent eCore. Marta remains extremely active beyond the UGA community, where she is involved with the Zoom for Seniors Mentorship, which trains Beta Sigma members. She remains active in the development and implementation of the Beta Sigma Chapter Virginia Macagnoni Grant and the Janett Gibbs Scholarship. As usual, Marta also spends much time helping with gemstone identification and evaluation for members of the community.

Mattia Pistone is setting up his experimental laboratory for synthesis of igneous rocks down the hill in the Hydrothermal laboratory. A small renovation and repair grant program now affords air conditioning throughout the building and the infrastructure now modernized to meet new / more stringent safety codes since the building was built in the 1960's for Vernon Hurst. Mattia was successfully funded by the International Continental Drilling Program that explores the drilling into the lower crust in the Ivrea-Verbano zone, which is in addition to his Swiss National Science Foundation funded study to examine fluid and gas mobilization during magma solidification. For more details go to the recent news item on his work linking [CO2 with volcanic eruptions](#). Mattia has been active garnering teaching grants and awards. Included is a grant that brings digital optical microscopy to the classroom and, after 31 years, Mattia will be Geology's next faculty member to join the prestigious Lilly Teaching Fellows Program (Liz Gordan was the last and only).

Bruce Railsback published in the highly respected journal *Catena* and continues to be an active researcher in the paleoclimate community. His paper documents the discovery of carbonate nodules in a humid climate (TN) where he connects their stable carbon isotope

composition to nearby stalagmites, which contain signals of C₃ vegetation (e.g., broad leaf trees). We learn from his study that seasonality of environment is as important as degree of aridity of the environment when recording the isotopic signatures into the rock record. Bruce remains productive by advancing his widely accessed website, with a new particular emphasis on fundamentals of Quaternary science (Railsback.org/FQS/FQS.html). This resource continues to increase in popularity amongst practitioners of geochemistry and beyond. Bruce continues to update and refine the history of the Geology at UGA. To learn more about past professors and their biographies visit the [department history website](#).... Maybe frequently, as the wave of retirement continues to pass for the next few years.

Sally Walker was a co-author on three papers that address new ideas in her discipline of paleoecology/paleoclimatology. In these publications, she covered the topics of 1) growth and longevity of the Antarctic Scallop; 2) Atom Probe Tomography of organics in shell growth increments of the Antarctic Scallop to assess diagenesis prior to stable isotopic analysis; and 3) multi-causal decline of an invasive marine snail in an estuarine ecosystem. Sally was successful in obtaining two grants. One was from the NSF Polar programs division, where she is using the Antarctic scallop as a key indicator of sea ice conditions for both the present and the past. Sally continues to be the pride of the Geology department though her position as the Shellebarger Professor of Geology and the [focus on faculty highlight](#), which features her perspectives on teaching and scholarship. Sally responds in an interview to one memorable experience that she'll always remember, which is seeing the aha moment in a student's face that transformed anxiety and puzzlement to pure joy as they figured out and solve a long-standing problem about their research.

Finally, one of the silver linings that emerged from the pandemic is that we started to virtually offer the department colloquia to alumni and other friends of UGA Geology. We have a great slate of speakers lined up for our series ahead and I encourage all that are interested to join us. It's free and details can always be found with information for how to join us by zoom at our website <https://geology.uga.edu/events/Colloquium>.

Go Dawgs!

Best,

Paul Schroeder
Professor and Head

