Ready . . . Set . . . GEO!

NEWSLETTER

Fall
2020

THE UNIVERSITY OF ALABAMA®
Department of Geological Sciences

Explore With Us

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Photos provided by faculty, staff, alumni, and students

Front page and Table of Contents photos are Winners of the 2020 Geology Department Photo Contest!

First Place Overall Award & Front Page Photo: Tom Tobin: "Unconventional Fossil hunting"
From Top to Bottom:
1st Place Student Award: Tyler Rigsby - "Cave Water Fall"
2nd Place Student Award: Asmara Lehrmann - "Rise"
3rd Place Student Award - Sydney Briggs - "Thin Section Beauty"
2nd Place Faculty Submission - Tom Tobin - "Great Sand Dunes Crest"
3rd place Faculty Submission: Joe Lambert - "DeSoto Caverns"

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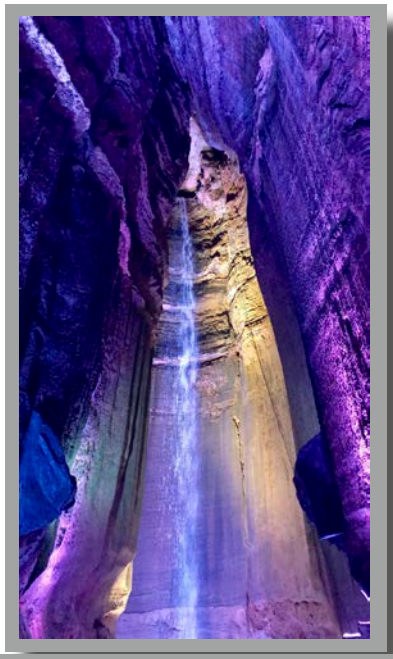
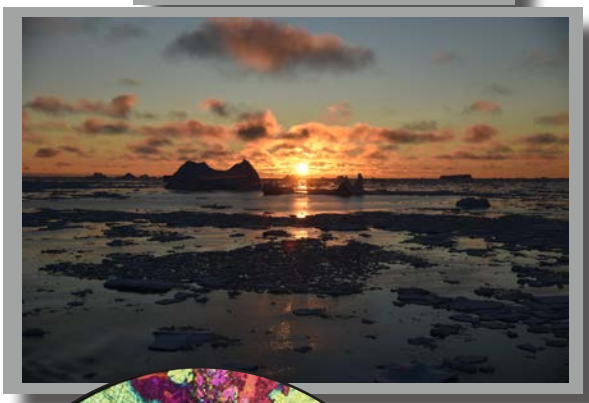
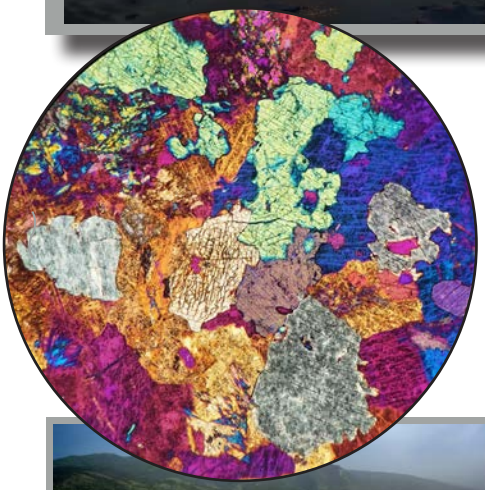
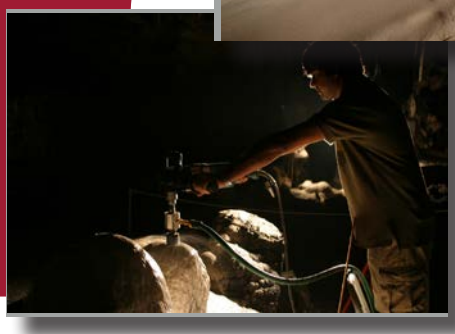




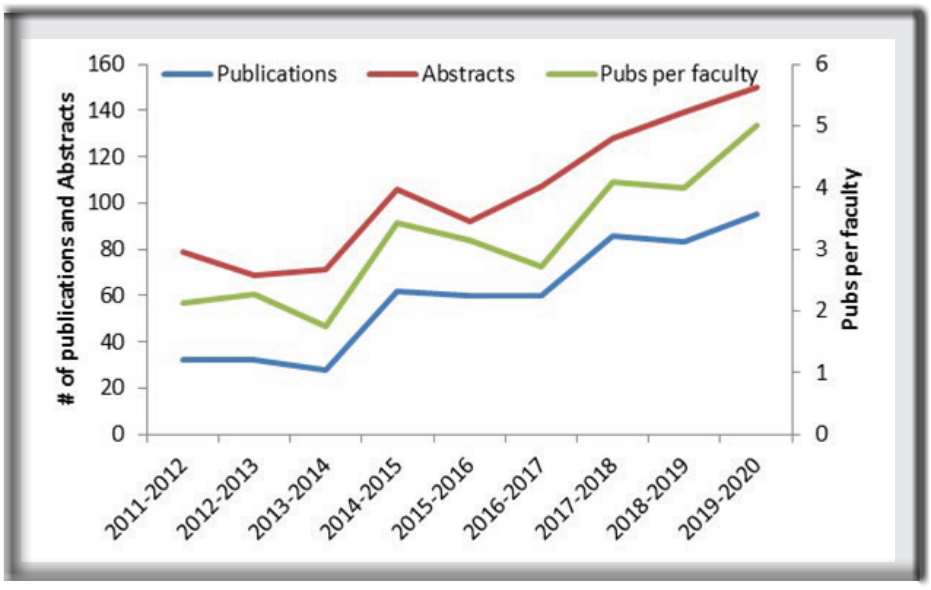




A letter from our Chair

Dr. Fred Andrus

Wow – this must be the most remarkable academic year in living memory! When it began, the department was enjoying an exceptionally productive time. Our enrollments surged by 8% and our majors increased 18%. Our student body became more diverse than ever, and we are continually striving to become more welcoming to all. Our graduate program was packed with talented and ambitious students, resulting in a record number of peer-reviewed papers and abstracts, two NSF Graduate Research Fellows, one NOAA Knauss Fellow, and grants from a variety of sources. Faculty also had a banner year, with a record 95 peer-reviewed papers and 150 conference abstracts, and won nearly 2 million in external grants, the most in over a decade. These funds came from a wide array of sources, including NSF, NASA, USGS, UA-AID, UCAR, State of Alabama, private foundations, and several companies as part of three new corporate partnerships and consortia. We had papers in the top journals, including *Geology*, *Science Advances*, and the *Proceedings of the National Academy of Sciences*. Alain Plattner was named to the inaugural class of NASA Early Career award winners, joining prior NSF Early Career awardees Kim Genareau and Sam Hansen (our new Lindhal Professor!), and Grey Nearing was named a Google Visiting Researcher. The Geological Sciences Advisory Board (GSAB) continued to be a critical asset, and Ron Tisdale took the helm from President Tom See after his successful term. Finally, we were all pleased that Delores Robinson agreed to serve as our next Chair. I have thought all along that her experience, temperament, intelligence, and dedication made her ideal for this role and I am grateful to finally return to the job I love most, knowing the department has a capable leader. Then came COVID 19… when campus suddenly closed at spring break, and faculty and teaching assistants rapidly moved 111 classes online, the office and lab staff reinvented the way the department functions, and we all somehow found a way to tackle this increased workload from home. Summer classes were also reinvented, including our "field" course, all of which took enormous effort by faculty and graduate students to teach remotely. This crisis ended all internships, field work, and most lab research, therefore creating new problems for our students. GSAB met online, and through their generosity, supported students through some of the resulting financial challenges, enabling them to find ways to continue their progress. Preparing for fall required faculty and staff to work harder this summer than ever before. We devised new ways to teach classes, invented new lab protocols to permit research to resume, and planned ways to make the campus as safe as possible for what promises to be the most challenging semester any of us have ever known. We will need be even more adaptable, creative, and productive in coming months, but I am confident we can find a way to thrive. I don't say that as a mere platitude, but rather having had the privilege to work with everyone these past 7 years as Chair, I know first-hand that this department is rich in resilient students, faculty, staff, and alumni.



Welcome Our New Chair

Dr. Delores Robinson

For those of you who don't know me, I'm Delores Robinson. I've been a professor in the DGS since 2003 and my research falls under the umbrella of Tectonics – a jack of all trades but expert of little. For the past 16 years, I've luxuriated in the ability to concentrate on research and teaching. I did a 6 year stint as the Graduate Program Director and recently decided it was time for me to step up in departmental governance. It is an interesting (*code for difficult*) time to take over the helm of the DGS. We are working through many challenges in our department and community. Fred Andrus has admirably and capably guided us for 7 years, and has set up the department well to deal with the Covid-19 pandemic in the fall. Together, we have set protocols for department behavior and ethos to keep us as safe as possible. We will continue to work at home when possible and physically distance while on campus and in our building. This new world is different, and adaption requires some discomfort. Communication through Zoom and phone calls is how we socialize and conduct all meetings. The lack of face-to-face contact may lead to isolation and a feeling of not belonging. We all must make sure that this does not happen. To anyone suffering, please reach out to friend, colleague or myself to get help or encouragement. Our mental, physical and emotional health is at stake as we adjust, integrate and move forward. Of course, I have aspirations for the DGS while I am chair but my major challenge is to help the DGS get used to this new normal. One major campaign underway in our department is recognizing our implicit and explicit bias in regards to diversity, equity and inclusion. In the past years, Fred has taken steps forward, and I will continue to help make our department better and more aware. I know most of us feel as though we are inclusive, but then realize we can do better when biases are pointed out. We have had great successes in the past year and you will see some of those successes detailed in this newsletter. Other successes are not as prominently displayed; however, they are valued as an integral part of keeping our department on the cutting edge of research and teaching. I'm proud of our department and thankful to Fred for his leadership. I hope this year will be as productive as it will be challenging. Feel free to contact me if you have questions or concerns.

Sincerely,

Faculty and Staff

Paul Aharon
Emeritus/Retired

Fred Andrus
Chair, Professor

D. Joe Benson
Emeritus/Retired

Deidra Butler
Office Associate II

Sid Bhattacharyya
Mgr/Geochem. Res Lab

Julia A. Cartwright
Assistant Professor

Ibrahim Cemen
Professor

Natasha T. Dimova
Associate Professor

Rona Donahoe
Professor

Debbie Frank
Support Assitant (Budget & Finance)

Kim Genareau
Associate Professor

Andrew Goodliffe
Associate Professor, Associate Dean of GS

Richard Groshong
Emeritus/Retired

Samantha Hansen
Associate Professor, Undergrad. Director

Takehito Ikejiri
Instructor

Joe Lambert
Env. Isotope Spec. ASIL Mgr

Karen Linville
Admin. Secretary

Yuehan Lu
Associate Professor

Ernest A. Mancini
Emeritus/Retired

Marcello Minzoni
Assistant Professor

Rebecca Totten Minzoni
Assistant Professor

Grey S. Nearing
Assistant Professor

Alberto Perez-Huerta
Associate Professor

Alain Plattner
Assistant Professor

Delores M. Robinson
Professor

Carl Stock
Emeritus/Retired

Harold Stowell
Professor

Berry (Nick) H. Tew
Professor, Director, Center for Sed. Basin Research

Geoff Tick
Professor, Graduate Program Director

Tom Tobin
Assistant Professor

Matthew Wielicki
Assistant Professor

Michelle Wielicki
Adjunct Professor

Bo Zhang
Assistant Professor

Yong Zhang
Associate Professor

Chunmiao Zheng
Adjunct Professor

The department mourns the loss of Jen Ho Fang. Dr. Fang was a respected faculty member and long-serving department chair. He helped usher the department into a more research-intensive way of operation. While he retired some time ago, he frequently visited campus and stayed in touch with us throughout the years. He made a huge positive impact on the department, its students, and his science.

https://www.kramerfamilyfuneral.com/obituaries/jen-ho-fang

He was honored by being inducted into our Founders Wall:

https://geo.ua.edu/alumni/founders-wall/

He was also honored by having a mineral named after him (https://www.mindat.org/min-1452.html) and through the creation of the Jen Ho Fang Endowed Scholarship that has supported many Alabama students over the years.

He will be missed, but his legacy lives on in our students, alumni, and the research program he helped build.

Faculty Updates

Ibrahim Çemen

Professor

Dr. Çemen and Ms. Beril Alkan-Gun, a TPAO Geologist, measuring stratigraphic section in Turkey.

The 2019-20 academic year, started just like any other academic year. In early August 2019, I returned from my overseas summer research with a grant from Turkish Petroleum Company (TPAO). The grant is a UA Office of Sponsored Programs administered research project. The project involved determining oil and gas potential of the Tuzgolu Basin in Central Anatolia, Turkey. Two of my former graduate students from the UA-DGS, Beril Alkan-Gun and Gizem Uyaroglu, were also part of the project as staff geologists for TPAO. We did extensive field work, examined available cores and thin sections from about 30 wells, and interpreted over 50 reflection seismic profiles. The summer research also gave me a chance to see my former graduate students who are working for the TPAO -- which now employs over 10 geologists with MS degree from the UA-DGS.

During the fall 2019 semester, I taught Geo 365; Structural geology and Geo 525; Petroleum System Analysis; advised my graduate students, and made commitment to lead AAPG's effort to organize a series of events during the AAPG-ACE conference in June 2020 to honor Dr. Albert L. Bally's contributions to Petroleum Structural Geology during his distinguished academic career.

In December, 2019 I enjoyed Chairing an Oral and a Poster session on "Extensional Tectonics and Basin Formation" during the AGU Annual Meeting, in San Francisco. The sessions were very successful. Participants engaged in lively discussions. During the meeting I was approached by an editor of the AGU-Wiley publications to edit a multi-volume Tectonics series. After several rounds of reviews and edits the book deal was finalized in July 2020. The series will be titled "Tectonics Processes: a Global View" and will be composed of the following volumes:

VolumeI. Extensional Tectonics: Continental Breakup to Formation of Oceanic Basins;
Volume II. Compressional Tectonics: Plate Convergence to Mountain Building;
Volume III. Strike-slip Tectonics: Oceanic Transform Faults to Continental Plate Boundaries.

During the spring, 2020 semester, I taught Geo 525: Tectonics of Sedimentary Basins and continued to advise graduate students. In late February, one of my graduate students, Robert Wencel and I had a very nice field trip to Oklahoma to collect LIDAR measurement data for his thesis project. During the field trip Robert and I had many conversations about how fast the semester was winding down and will end soon.

The end of the semester came but in a way no one could image. I never saw my students in a class setting nor in-person meetings after the term break in March, 2020. However I still completed my class online and my new graduate students successfully defended their MS thesis proposals in virtual settings. The AAPG-ACE meeting is rescheduled in a virtual setting in September, 2020. What happened? The unprecedented events of COVID-19 pandemic came upon us and our lives were basically confined into our homes and online meetings. We will see how the events of the spring and summer of 2020 will create a "new normal" for all of us in the years to come.

During the academic year of 2019-2020, I published 4 journal articles and participated in 11 conference presentations, either as solo, senior author or co-author. The references to these articles and presentations can be found in my CV in the UA-DGS webpage.

Harold Stowell

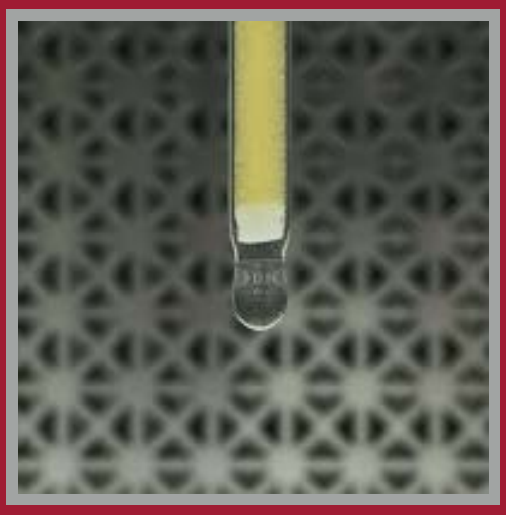
Professor

RadIs Lab

As one of the senior faculty members in Geological Sciences, Harold Stowell began the last academic year thinking that he would continue an old routine of teaching mineralogy, mentoring graduate students, teaching field course in New Mexico, and then pursuing field-based research in British Columbia, Canada. However, this was not to be. First, I made the decision to withdraw from teaching the field class which is taught in Taos, NM during the summer. This was a very difficult decision because field geology in northern New Mexico has been a huge part of my summers for the last 30 years. However, this cancellation proved to be the first of many cancellations as the COVID 19 pandemic swept through the world and all of my numerous plans for conference and research travel were cancelled.

Most of my research efforts during the last 5 years have focused on producing high precision isotope data from the VG Sector 54 thermal ionization mass spectrometer in the RadIs lab (https://radis.as.ua.edu). These isotope data are used to determine the age of garnet growth in high temperature metamorphic rocks and evaluate the nature and origin of magmas. Sampling has concentrated on magmatic arcs in southernmost New Zealand and British Columbia which provide crustal sections through the lowermost and middle sections of Cretaceous continental magmatic arc systems. Ongoing work is evaluating the origin of observed high fluxes of magma during brief periods of subduction in both of these magmatic systems.

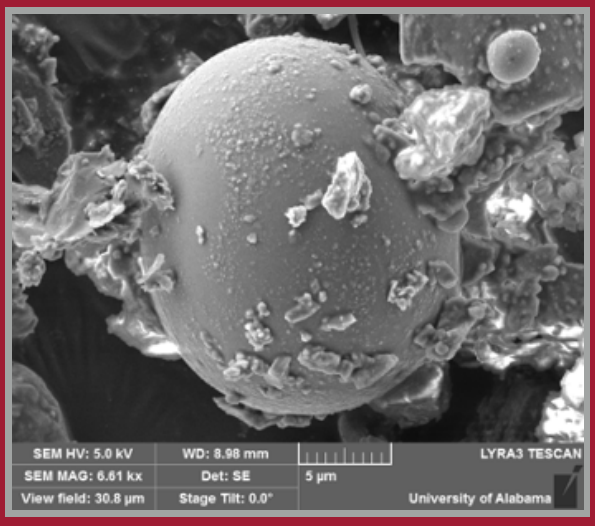
With travel cancellations, online teaching, and lab lockdown after mid March 2020, my focus changed from field work and data collection in the lab to writing and editing. Perhaps the best result has been spending more time helping graduate students with their projects. These changes related to the pandemic also allowed me to spend more time at my house in Colorado.



Thermal ionization mass spectrometry requires ion chromatography (left) to separate and concentrate individual elements (e.g. Sm and Nd). These liquid concentrates are then loaded onto a filament (right) for ionization in the mass spectrometer.

Kim Genareau

Associate Professor



High-resolution secondary electron image of lightning-induced spherule produced in volcanic ash samples subjected to current impulse experiments (collected in the AARC by Taylor Woods).

During the last academic year, I largely focused on research, writing, and collecting preliminary data for new projects during my sabbatical leave over the fall 2019 semester. I traveled to Ludwig Maximilian University (LMU) of Munich, Germany to conduct shock tube experiments at their experimental volcanology laboratory. The lab has previously conducted research on volcanic lightning using the shock tube apparatus and I visited to examine the role of ice in triboelectrification. The results, currently in preparation for publication, document the interactions between volcanic ash grains and ice crystals during decompression events and how these interactions affect the polarity of lightning discharge. The collected data were used as the basis for a proposal I submitted in April to the National Science Foundation's (NSF) Physical and Dynamic Meteorology program to explore the role of ice grain composition and size in determining the polarity of cloud-to-ground lightning strikes.

Shock tube apparatus in the experimental volcanology lab at LMU. The shock tube (extending from the bottom of the illuminated tank) was submerged in liquid nitrogen to keep the ice grains within it frozen for the decompression experiments. Following the decompression, the samples expand into the tank above, where generated lightning is measured and recorded with a high-speed video camera.

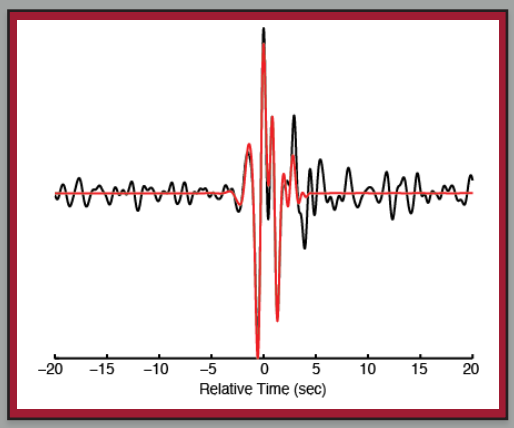
The past year has included continuing research for my NSF CAREER award to characterize the physical and chemical effects of lightning on volcanic ash particles. The most recent results of this effort were published in *Earth and Planetary Science Letters* describing the influence of lightning-induced shock wave propagation on ash textures. Taylor Woods is continuing her dissertation research on the geochemical effects of lightning on volcanic ash. She shared some recent results in an expertly delivered oral presentation titled "Chemical Alteration of Volcanic Ash due to Simulated Lightning Experiments" at the American Geophysical Union's Fall Meeting in December. Taylor also successfully completed her Ph.D. candidacy exam in the spring of 2020 and is finishing up her first manuscript describing further chemical analyses of lightning-induced volcanic spherules. Additionally, Taylor also published the results of her M.S. research in the *Journal of Volcanology and Geothermal Research*. Her paper, titled "Influence of grain size and shape on volcanic ash electrical conductivity" provides a unique and methodical analysis of the role physical properties can play in the electromagnetic characteristics of naturally occurring materials.

Samantha Hansen

Associate Professor

The previous year included a number of milestones for me. In Fall 2019, I was awarded the George Lindahl III endowment, and just recently, I was promoted to Full Professor – coinciding with my 10-year anniversary at UA. I also continue to serve as the DGS Undergraduate Program Director.

Earlier this year, I published an EPSL paper focused on investigating ultra-low velocity zones (ULVZs, anomalous regions near the core-mantle boundary) using ScP core-reflected phases recorded from a seismic network I operated in Antarctica. Working with colleagues at Arizona State University and The University of Leeds, I am now expanding this work to encompass other seismic phases. I also submitted an NSF proposal for a new seismic array in Greenland, and my proposal for a new project in the Antarctic Wilkes Basin is pending logistics approval. So hopefully there is some exciting fieldwork in the future!



Example ScP waveform (black) and its corresponding synthetic (red) from an earthquake that occurred on Feb. 1, 2014 and that sampled the core-mantle boundary beneath the Antarctic Weddell Sea. The data is fit significantly better by a model that includes a ULVZ.

From my research group, Ashish Kumar, a Ph.D. student who joined my lab in January 2019, continues his project using the Alabama Supercomputer Center facilities to generate full waveform ambient noise tomography models for East Antarctica. My other Ph.D. student, Hesam Saeidi, joined the department in August 2019, and he is developing new adaptively parameterized P- and S-wave tomography models for the continent of Africa. Undergraduate student Isabelle Evans was also helping with that project until she graduated this summer; she is now pursuing her M.S. at Columbia University.

As many people know, I love to travel, but the COVID-19 pandemic has significantly impacted that hobby. Over the 2019-2020 winter break, I was fortunate to take a cruise with my mother, traveling from Florida to California via the Panama Canal (with other stops along the way). It was great fun, and I hope to get out into the world for more adventures soon!

The Panama Canal: shortening the trip between the Atlantic and Pacific Oceans by ~9000 miles.

Marcello Minzoni

Assistant Professor

Lucas Nibert by a Pleistocene reef outcrop in Havana by the Hotel Nacional

Despite the great challenges brought forward by the global pandemic, Dr. Marcello Minzoni and his students in the University of Alabama Laboratory for Integrated Carbonate Research (UALICR) continue to tackle important aspects of the depositional and diagenetic history of the Smackover Formation, the Permo-Triassic carbonate platforms in south China, and Pleistocene-Holocene carbonates in Cuba.

Doctoral candidate Carmen Atkins has analyzed geochemical data from several cores of the Smackover in Alabama and is working on a novel depositional model based on Jurassic ocean chemistry and circulation patterns. Graduate student Karena Gill has spent much of the semester analyzing tiny fluid inclusions in carbonate crystals from the Smackover to assess initial oceanographic conditions of the Jurassic Gulf of Mexico and test several dolomitization models. Following a visit to China in January 2019, graduate student Souvik Bhattacharjee has focused on generating stratigraphic forward models of an Early Triassic platform margin to evaluate the controls on facies distribution and reservoir quality. Initial results have highlighted the occurrence of a Late Permian isolated carbonate buildup previously undocumented.

Finally, MS student Lucas Nibert has been working on documenting his groundbreaking research on the depositional controls of carbonate mud mounds in Cuba and analogue features in Florida Bay from satellite imagery. Dr. Minzoni and Lucas returned to Cuba in October 2019 to work with Dr. Jesus Pajon (National Museum of Natural History of Cuba) and the Centro de Investigaciones Marinas (CIM) on setting up logistics and permits for field work. Additional expeditions to Cuba that were planned for Spring 2020 had to be cancelled following traveling restrictions related to the COVID-19 pandemic.

Summer 2020 marked the official kickoff of the University of Alabama Energy Consortium (UAEC). The UAEC will initially focus on the regional study of the Norphlet and Smackover Formations and the controls on reservoir and seal distribution. The industry consortium is currently funded by British Petroleum but is expected to attract additional major and mid-size companies. Besides providing funding for RA positions, the UAEC will offer DGS students a great opportunity to work on industry-related projects and interact with geoscientists in industry.

After a successful Sequence Stratigraphy class taught in the Fall of 2019, teaching went virtual in the second half of Spring 2020 as a safety measure against the raising threat of the pandemic. Our Imperial Barrel Award (IBA) team (Tyler Wood, Lucas Nibert, Victoria Fitzgerald, and Robert Wencel) did a great job despite the formidable challenges of working remotely and gave their best in the first ever virtual competition. The pandemic took also a strike on the hard work put together to organize a field class in China, which had to be cancelled. The preparatory work, however, will be used as a template for future field classes, which will include, beside China, Italy, the Bahamas, and Cuba.

From Left to Right, Jesus Pajon, Marcello Minzoni, and Lucas Nibert in Havana Viejas

Tom Tobin

Assistant Professor

My name is Tom Tobin, and I'm an assistant professor beginning my sixth year here at the University of Alabama. In my research I primarily use paleontological and geochemical tools to examine the Cretaceous-Paleogene (K-Pg) mass extinction, and the paleoecology of important victims, like ammonites, but am interested in a variety of other questions that can be answered with similar tools.

This has been an exciting year in my lab. A new equipment purchase, funded by a recently awarded NSF grant, has been largely completed, and the new clumped isotope mass spectrometer has arrived at the Alabama Stable Isotope Laboratory (bottom-right photo). Unfortunately, the COVID-19 travel restrictions went into effect before we could get the instrument installed, but we will begin installation once it is completely safe for the installation technician to travel and work in close proximity with us.

Rachel Mohr, a previous M.S. student and current Ph.D. student in my lab, had her first manuscript published in *Geology* reporting the extensive work on seasonality across the K-Pg boundary in Antarctica from her M.S. degree (Mohr et al., 2020). Bridget Murray, my current M.S. student, was awarded several grants to fund her research on Alabama caves, and is currently completing an internship with the National Park Service. Kaydee West is continuing her research on accessibility in geosciences. Two new graduate students will be joining the lab in the next academic year, Sam Stanford in Fall 2020, and Jessie McCraw in Spring 2021, both of whom will be working on paleoecological questions.

Undergraduate researchers in my lab have also had successful years. Jacob Honeck was a coauthor on a manuscript I recently submitted based in part on his undergraduate research on the K-Pg boundary in Montana, and he presented his research at GSA 2019. Jacob was also able to join me for field work in Montana in the summer of 2019 (above photo), though we chose to cancel the 2020 summer field trips. Jacob and I can be seen explaining our field work in *Prehistoric Road Trip*, a three-part series that aired on PBS in June 2020. Caroline Doughty was awarded a UCRA award to fund her isotopic research, also related to the K-Pg boundary in Montana, and was a co-author on a GSA 2019 presentation on her previous ammonite research. Stephanie White also presented her undergraduate research at GSA 2019, and is moving on to graduate school.

A variety of other studies related to my research in Montana and Antarctica were published in the previous year (Fendley et al., 2019; Linzmeier et al., 2020; Milanese et al., 2020; Tobin et al., 2020). The following academic year is likely to be full of unique challenges and complications, but I'm looking forward to installing our new isotopic equipment and continuing several ongoing research projects led by my graduate and undergraduate students. We're all also excited to welcome new students to the lab, and to see what direction their studies take them.

Yuehan Lu

Associate Professor

Dr. Yuehan Lu (with Mou-Mou, middle, and Ichi, front) are collecting samples from the Chattanooga Shale outcrop to test the hypothesis that the very first radiation of land forests led to marine mass extinction events ~370 million years ago.

Our Molecular Eco-Geometry (MEG) group specializes in using *Biomarkers* to understand fundamental ecological processes in contemporary environments and over geological timescales. *Biomarkers* are organic molecules that are produced by specific organisms (e.g., bacteria, plants, animals), and they have resistant core structures to be preserved for a long time—even over billions of years! Using this powerful forensic tool, we are able to determine the evolution of life forms and their interactions with surrounding environment. For example, our current project (funded by the American Chemical Society) is investigating the link between the very first radiation of land forests and the mass extinction of marine life ~370 million years ago. Another project funded this year (by the state of Alabama) is to use biomarkers to fingerprint the sources of sediments in the Mobile Bay, which will contribute to restoring the health of the Gulf of Mexico Watershed.

In the last academic year, our group published 13 papers and gave ten research presentations. In the coming year, we will welcome two new members, Sakinat Ahmad as a new Ph.D. student and Dr. Man Lu as a postdoctoral researcher. A few updates on the status of current members— Shuo Chen (4th year, Ph.D. candidate) has completed data collection and is writing to seek publications from her Ph.D. research. Jian Chen (2nd year Ph.D. student) continues working on the Devonian black shales to decipher the causality of the Late Devonian marine anoxic events and mass extinction. The Shark Lady, Chelsea Comans (2nd year M.S. student), has made great progress in collecting data from hundreds of Cretaceous shark teeth from Alabama.

DGS Ph.D. student Shuo Chen (front left) on a water and sediment sampling trip along the Alabama river system with UA Geography and NEON (National Ecological Observatory Network) researchers.

The year 2020 seems to be filled with changes and uncertainties. Although changes are inevitable, apprehension is optional. We are prepared to stay centered while flowing with new challenges, following the wisdom of Taoism philosophy.

Drs Yuehan Lu, Takehito Ikejiri and DGS graduate students are collecting data from Devonian subsurface cores at Kentucky Geological Survey

Olivia Warren successfully defended her Masters' thesis on characterizing the molecular composition and ecological fate of dissolved organic matter in glacier-fed rivers on the Tibet Plateau. Her work provides new evidence that alpine rivers are particularly vulnerable to climate change and global warming.

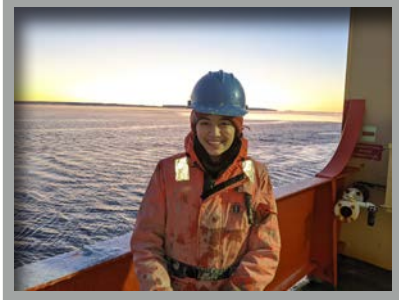
Another (Virtually) Successful Field Camp

Google Earth photograph of El Capitan in Yosemite National Park, one of the locations visited by students this summer in GEO 495 as part of a virtual field trip developed by Dr. Nicolas Barth at the University of California, Riverside.

This past June, we completed another successful season of the summer field course (GEO 495), but this year we had to do it virtually. Due to restrictions from the COVID-19 pandemic, we were unable to travel to New Mexico and had to reformulate the course for online instruction. As director of the field course, I took part in an effort through the National Association of Geoscience Teachers (NAGT) to establish a database of virtual field trips and instructional modules offered online for times such as these. The seven undergraduates who completed GEO 495 this summer learned methods of field mapping, structural relationships, and stratigraphic analyses by "traveling" to locations, using Google Earth and other web-based platforms, that they would typically not have the opportunity to visit. Students explored Iceland, Yosemite National Park, Ireland, Australia, Wales, and other geologically interesting spots around the globe. The instructors (me, Dr. Delores Robinson, Dr. Tom Tobin) were helped tremendously through the commitment and effort of our teaching assistant, Taylor Woods. Taylor met regularly with students via Zoom to provide guidance and clarification on various assignments. Constructing the five-week virtual field course was a challenging but very informative task that taught us all the value of field-based learning and ways we can improve GEO 495 in years to come.

An Antarctic Fieldwork Voyage

Asmara Lehrmann, Ph.D. Student



Asmara Lehrmann is a Ph.D student working with Dr. Becky Minzoni in the UA Sedimentary Geology and Micropaleontology Lab. During the spring of 2020, she spent 65 days aboard the RVIB Nathaniel B. Palmer on expedition NBP20-02 to study the seafloor sediments surrounding Thwaites Glacier, Antarctica with Thwaites Offshore Research (THOR).

Even though this was her first time at sea, the comradery of her colleagues made her feel right at home. Each shift, she had the opportunity to take a short break from work to appreciate the breathtaking view of the sunset and sunrise backdropping the icebergs and wildlife.

NBP20-02 was filled with excitement and unique circumstances. During this expedition the team rescued a trapped fishing vessel, discovered an unmapped island, endured a delayed return due to sea ice coverage, and navigated pandemic related port closures. Despite all of these events, they exceeded predicted sampling and data collection and had a very successful field season. Asmara returned to UA with over 1,000 lbs of sea floor sediment! She is excited to get back in the lab to study the foraminifera in these samples!

Christine Bassett selected for NOAA Fellowship

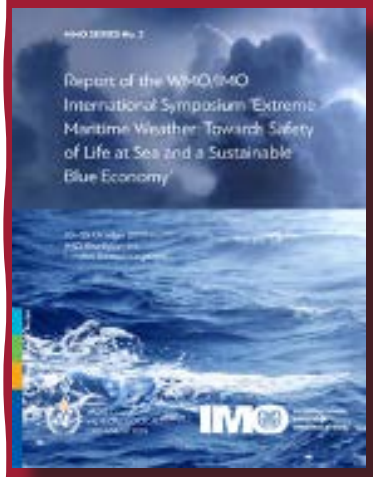
This last February, I began my 1-year fellowship with the NOAA National Weather Service's (NWS) Office of Observations in Washington D.C.. While it may seem peculiar for a geoscientist to be hanging out with a bunch of meteorologists, I've been able to contribute a holistic perspective of Earth processes that I cultivated during my geoscience studies at UA. I've also been able to pull from my undergraduate background in anthropology to bring nuance to conversations about how people interact with their environment.

Hiking up Mt. Ballyhoo in the Aleutian Islands after a day in the field.

The mission of the NWS is to provide weather, water, and climate data, forecasts, and warnings for the protection of life and property and enhancement of the national economy. While most are familiar with land-based warning services, such as those for tornados, winter weather, and coastal impacts from hurricanes, fewer are familiar with how this mission extends to maritime weather needs. During my time at the NWS, I have worked to support this mission in two key areas: 1) the Tropical Pacific Observing System (TPOS) and 2) the World Meteorological Organization's Standing Committee for Marine Meteorological and Oceanographic (WMO SC-MMO) services.

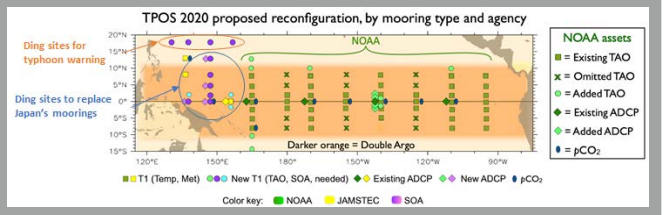
The Aleutian Islands, also known as the birthplace of the winds, is characterized by its rapidly changing weather. Pictured is a vessel sits in the Port of Dutch Harbor on a sunny day with low cloud cover.

As part of TPOS, NOAA maintains the Tropical Atmosphere Ocean (TAO) array, a system of 55 oceanographic and weather buoys along the equatorial Pacific. The TAO array provides data that are critical for analyzing and predicting climate phenomena such as El Niño and La Niña, which have a substantial impacts on US and global weather through floods, droughts, forest fires, and other severe weather. These data are also used in the Navy's ocean and weather forecast models. To support this program, I have been working closely with the National Data Buoy Center to develop a plan and cost estimate for enhancing the existing array and deploying additional enhanced buoys that will ultimately result in improved forecasting.



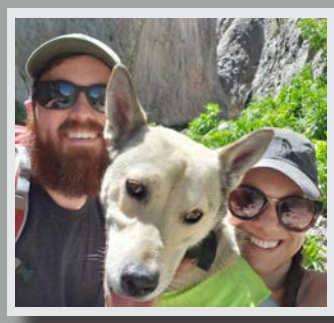
As part of my work with the WMO SC-MMO, I co-authored a report summarizing the inaugural symposium hosted by the WMO and International Maritime Organization. This symposium highlights the opportunities to improve communication of maritime hazards between marine meteorologists and the maritime industry (World Meteorological Organization, 2020).

In addition to contributing to an improved meteorological and oceanographic observation system, I have also been working with an international team on the WMO's SC-MMO to develop a framework and strategic plan for offering guidance and recommendations on providing marine services such as forecast and warning products for maritime and coastal hazards (e.g. extra tropical cyclones, coastal inundation, sea ice, and tsunamis). To do this successfully, we have not only had to understand the physical science aspect of marine hazards, but also the cultural, economic, and political pressures that impact stakeholder risk, vulnerability, and decision making.



Proposed locations of the future TAO array buoys (Kessler et al., 2019)

Last but not least, I've really enjoyed gaining an insight and appreciation for the many considerations that are taken to generate weather and climate forecasts and predications from meteorological and oceanographic observations. I've also appreciated the opportunity to spend time (virtually!) with senior NWS leadership, including its Director, Dr. Louis Uccellini, to talk with them about their roles in shaping NWS priorities as well as benefit from their career advice and perspectives. After the fellowship ends next January and I've defended my dissertation, I'm hoping to continue working with the NWS until I decide what my next adventure will be.



Alumni Spotlight

Name: Travis Sizemore
Year Graduated from UA and degree: 2018, MS
Current Job Title: Physcial Scientist/GIS Specialist
Current Employer: US Bureau of Reclamation, Boulder City, NV

What are your main duties and responsibilities in your current position?

My geology career took a very techy turn with this position. Most of my work involves using ArcGIS to support a team of about 50 biologists who are creating, monitoring, and maintaining widlife habitat along the Colorado River. It's all part of a 50-year project to preserve and study species that have been impacted by the creation of the dams along the river, including the Hoover Dam, which is just down the road from me. I'm only five months into this job, so this year I will make a lot of maps, write Python code to automate tasks, and develop data solutions for other scientists. Normally I would be doing fieldwork as well, but with the pandemic, most fieldwork has been cancelled lately. Starting next year I will be also be conducting research projects of my own, which will be mostly based on remotely-sensed data from satellites, planes, and possibly drones, along with some fieldwork to collect data for model calibration and verification.

How did the Department of Geology prepare you for your career?

Learning about geology prepares you for a lot of science positions, even outside of traditional geology jobs. I've worked in a number of positions in the government and private sector that covered a range of topics from biology, hydrogeology, hydrology, and geospatial science. In each position, my employer expressed that they had confidence in hiring me because he or she viewed my geology training as evidence that I am capable of thinking through spatial and temporal problems, following the scientific method, and willing to get outside and rough it to get data. Beyond employer expectations, my time at UA gave me the confidence to plan and conduct my own research, give presentations, lead meetings, teach others, and juggle a heavy workload. I am grateful to Dr. Cemen and Dr. Wielicki and many others in the department for guiding me through the process and creating opportunities for me to develop those sought-after skill sets.

What advice can you give to current students who wish to pursue a similar career?

Make yourself stand out, regardless of your career path. As I was a fairly overachieving undergrad, I still applied to hundreds of positions before I landed that first job. Find yourself an internship, a fellowship, a catchy thesis project, start or lead campus organization, publish something, or give a talk at a conference or two. Do as much as you can, because there are thousands of other geology majors about to graduate when you do, and they will be competing for the same jobs, along with thousands of geologists changing jobs. Also, keep in mind that your classmates will probably be one of your greatest resources for networking, so it's a good idea to maintain positive relationships and your reputation as a strong student among them.

If you want to continue with a science-focused career, I strongly recommend getting your MS or Ph.D. Nowadays, most bachelor-level positions begin as technicians and then eventually develop into client and personnel management positions. There is nothing wrong with that if you want that career track; however, the positions that involve leading science projects almost always go to those with graduate-level credentials.

Finally, if you want to work for the federal government, take a keen interest in learning all the ways to get your foot in the door, such as the Pathways program, the Student Conservation Corps, and volunteer programs such as Americorps. Secondly, take a deep dive into learning about federal hiring process. While applying for a gov job is remarkably easy, actually getting one is a game of how well you understand the system, who you know, and how thoughtful and crafty you are with your resume. There are many people out there who know how to play the game well. Fortunately, there are abundant resources on winning strategies on Facebook groups, Reddit, and dozens of how-to websites. Lastly, don't be afraid to ask for help. Reach out to people who work for the government, including myself (t.sizemore55@gmail.com). It feels good to help others, so most people will be glad to give you advice or sometimes even put in a good word for you.

President
Sam Walker
Email: srwalker6@crimson.ua.edu

Vice President
Tyler Wood
Email: tjwood3@crimson.ua.edu

AAPG
Department of Geological Sciences

The American Association of Petroleum Geologists (AAPG) Student Chapter Update

The 2019-2020 academic year was a time of professional and academic progress for the American Association of Petroleum Geologists (AAPG) Student Chapter. Our active member base continued to represent the University of Alabama and the Department of Geological Sciences on campus and abroad at recruiting events, conferences, and national competitions, further establishing our department as a hot bed in the Southeast for talented students and future industry professionals.

As of June 2020, the membership is at 28 grads and undergrads, and we aim to expand as the department recruits new graduate students! Continue reading below to learn about what the chapter has been up to…
Professional Development

The AAPG student chapter hosted and attended numerous professional development and recruiting events to facilitate professional development and attract recruiters to the excellent caliber of students here in the department.

In partnership with AIPG, the AAPG chapter hosted a Resume Clinic and Professional Networking event with Appie Milsaps of the UA Career Center to give students a primer on topics such as networking, common interview mistakes, and 3-minute elevator pitches, to better prepare undergraduate and graduate students to enter the workforce.Recruitment

In September, AAPG and the AIPG student chapter jointly hosted Jim Redwine of Anchor QEA for an informational session/recruiting event about open positions in their Birmingham Office. This event resulted in the hire of 2 UA geology students: Chris Barnes and Kelly Lee. In early October, student chapter members and other geology students attended a regional recruiting event at Auburn University organized by Chesapeake Energy. Each student had the opportunity to interview with Chesapeake geologists and discuss employment opportunities while networking with Auburn faculty and graduate students.

Later that month the chapter hosted Rue Beyer, a geologist at Nevada Gold Mines and alumna of the department. The weekend involved a student lunch, where Mrs. Beyer spoke briefly about life in the mining industry, employment opportunities, and helpful tips on how to acquire employment.

Chapter Accomplishments

Once again, the department successfully competed in the Imperial Barrel Award (IBA) competition, an international geology competition that tests students' abilities to analyze large oil and gas datasets and present their findings to senior management.
Chapter members Karena Gill, Asmara Lehrmann, Samuel Walker, and Zachary Yates received grants from the AAPG Grants-in-Aid program, which provides funding for graduate students studying topics relevant to the search for petroleum and energy-mineral resources, and/or environmental geology issues. We look forward to seeing the outstanding research produced by these students!

Social Events

This was an eventful year for AAPG social gatherings. Throughout the football season, the AAPG chapter hosted two tailgates on The Quad: one at homecoming and one at the Alabama vs. LSU game. Students and faculty both enjoyed time outside the department. Grill-master Lucas Nibert granted those in attendance with high-quality hamburgers and, on one occasion, carne asada tacos. Due to popular demand, more tailgates are planned for future games. We hope to see you all there!

The chapter also designed and sold department t-shirts. There are plans to design and sell DGS polos this upcoming semester so our students, faculty, staff, and alumni can look sharp and represent our department at national conferences while presenting research.
Closing Remarks and Future Events

As always, the AAPG student chapter at the University of Alabama is happy to accept new members. If you are a student looking to join, or an alumnus wanting to come speak at a meeting or check in on the chapter, please feel free to contact us. Now is an exciting time to join the chapter as we are planning more events for the Fall semester, including a student camping trip to Mount Cheaha, more tailgates, and more recruiting events.

You can keep up with the chapter on LinkedIn .

SGE

The Society of Sigma Gamma Epsilon
Alpha Chi Chapter

Who We Are:

Sigma Gamma Epsilon is a national honor society. From the SGE website, "The Society of Sigma Gamma Epsilon was established to recognize scholarship and professionalism in the Earth Sciences. It has for its objectives the scholastic, scientific, and professional advancement of its members and the extension of relations of friendship and assistance among colleges and universities which are devoted to the advancement of the Earth Sciences."

What We Do:

The University of Alabama has its own chapter of SGE: the Alpha Chi Chapter!

At the Alpha Chi Chapter of SGE, we take part in various activities related to environmentalism and the outdoors. Typically, we go on one camping trip each semester with locations specifically chosen to showcase Alabama and the Southeast's remarkable geologic features. Another activity we are beginning to include is volunteer-based water monitoring through the Alabama Water Watch program. We also plan day-hikes and fossil hunts in pristine locations such as Cane Creek Canyon, AL. The SGE Alpha Chi Chapter will also host tutoring sessions for undergraduate courses, such as mineralogy, based on student demand. We usually have a few in-person meetings on weekday evenings to eat pizza, plan events, and catch up. However, we are currently transitioning to an activity-based meeting style geared towards local water monitoring and hiking on the weekends.

How to Join:

If you are interested in joining Sigma Gamma Epsilon's Alpha Chi Chapter, please contact the chapter President Adrian Wiggins at aawiggins@crimson.ua.edu, or Vice President Jamekia Durrough-Pritchard at jdawson1@crimson.ua.edu.

Alabama Analytical Research Center

The 2019-2020 year has been an exciting and challenging year for the Alabama Analytical Research Center (AARC). The AARC was formally created in October of 2019 through the merger of the Central Analytical Facility (CAF) and Center for Materials for Information Technology (MINT). Through this merger the AARC acquired two new staff members (Dr. Michael Buettner & Carrie Martin) in addition to two XRDs, one XPS, and one PPMS; these acquisitions help to bolster the ability of the AARC to serve research at UA and beyond.

As the Spring of 2020 changed the way UA and other institutions operated, the AARC shifted gears to focus on technique related research and distance learning. A number of new guides for training have been prepared, with older guides being refreshed and updated prior to uploading to the AARC website. As more students have returned to campus and research has begun to spin back up these guides have been helpful in one of the most important AARC goals: training users in safe and efficient instrument operation. The need for safety led to a combination of Team Viewer/Zoom training sessions prior to users getting hands on instrument experience.

To compliment this, Dr. Buettner has spearheaded the development of an AARC website dedicated to training. On this site, users will be able to view both the basic training documents staff have produced as well as more in-depth topics surrounding analytical techniques and instrumentation provided by the AARC. This is still a work in progress that will continue to grow in the months ahead. An additional and very visible tool for learning was completed by Johnny Goodwin, who over a period of months methodically cut and assembled an older model Hitachi transmission electron microscope (TEM). This will serve as both a centerpiece for the entrance to the Bevill building and a valuable teaching aid for microscopy, exposing the inner workings of the electron column which many operators never see.

Have a look at our website for a look at AARC capabilities and services. Anyone with questions is encouraged to get in touch by email: raholler@ua.edu.

https://aarc.ua.edu
https://training.aarc.ua.edu

Gregory Thompson - Director

Robert Holler - Manager

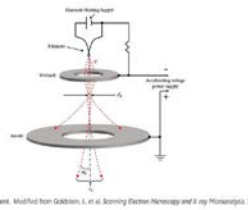
Johnny Goodwin - Instrumentation Specialist

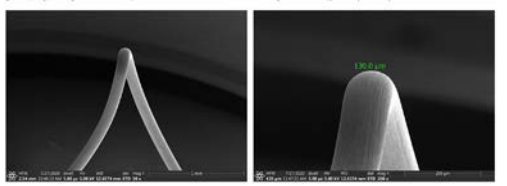
Michael Buettner - Instrumentation Specialist

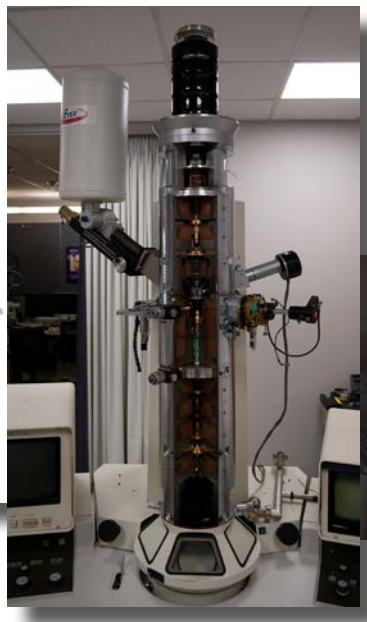
San Dab - Instrumentation Specialist

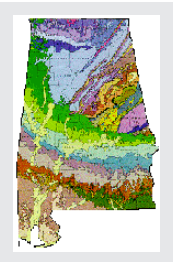
Carrie Martin - Program Assistant

Mary Robinson - Office Associate Senior









2019 - 2020 Update from the Geological Sciences Advisory Board (GSAB)

Our Fall 2019 GSAB meeting took place at the University of Alabama in Tuscaloosa the weekend of October 26 in conjunction with Homecoming and the Arkansas game. Social activities included an Alumni BBQ located in the Bevill Building on Friday and on Saturday before the football game, the Department of Geological Sciences hosted a children's fossil dig along with displays in the College of Arts & Sciences tent on the Quad near Denny Chimes. Sunday evening, the board enjoyed a pre-meeting social and dinner at the Half Shell Oyster House located in downtown Tuscaloosa. Our formal board meeting took place on Monday, October 28th in the Bevill Building with approximately 33 members in attendance. The finance, membership, nominating, and scholastic committees met and related business discussed, a State of the Department of Geological Sciences presentation was given by Dr. Fred Andrus, and a State of the College of Arts & Sciences was given by newly appointed Dean of Arts and Science, Joe Messina, who replaced retiring Dean Robert Olin. Dean Olin was a strong advocate and friend of the GSAB for many years. Several new nominees were suggested for GSAB membership consideration and two new members, Dr. Robert Olin and Mr. J.D. Gramling lll were added to the membership of the GSAB.

Lunch was held with Honors Day students, recipients of the Jones, Hooks, Joiner, and GSAB Scholarships, as well as members of the Tom Joiner family. During lunch, GSAB chairman Tom See presented the Joiner family with a framed resolution and plaque in honor of Mr. Joiner who had recently passed away. Tom Joiner was one of the original founders of the GSAB and was its principal spokesperson and advocate over the years. He was also a former State Geologist of Alabama and Chairman of the Alabama Oil and Gas Board, a principal of Tom Joiner and Associates, and a highly regarded and influential representative for education in the state of Alabama. His leadership will be greatly missed.

Our Spring 2020 GASB meeting was to have been held at Guntersville State Park, but unfortunately, the in-person meeting was an early casualty of the Covid-19 pandemic. With the challenges we all have experienced as a result of this pandemic we were unable to meet in person, so we initiated our first ever virtual meeting using a Zoom venue. There were approximately 28 members that participated in the meeting. All meeting preparation was handled

digitally with data for the various committee meetings as well as the general meeting packet provided by email prior to the main meeting. With the various committees meeting virtually prior to the general meeting, we were able to take more time for critical discussions during the general meeting.

Tom Joiner, distinguished alumnus, former Alabama State Geologist, businessman, and philanthropist

These pre-meeting steps were highly effective, and we conducted all business within a three-hour time frame. After the meeting, a special request was sent to the GSAB for student hardship funding and $3,750 was raised for student help in addition to our normal GSAB funding. Overall, from spring through the summer the GSAB has funded $39,500 in scholarship funds awarded which has helped greatly considering financial shortfalls present during this pandemic. During the committee, state of the college, and departmental reports, discussions were held to determine how the GSAB could be effective in mitigating the challenges to the department caused by the pandemic. New nominees were suggested for consideration of GSAB membership and two previously approved new members were added to the GSAB, Mr. Terrell Rippstein and Ms. Helen Sestak. After two years of outstanding leadership and setting a new bar for GSAB spring field trips (by being host of our meeting at NASA in Houston in 2019), Tom See stepped down as chairperson. Our new officer group was voted into place at the close of meeting with Bob White, Secretary-Treasurer, Ralph Hellmich Vice Chairperson, and Ron Tisdale Chairperson. Each will serve a two-year term. Unfortunately, due to the continuing pandemic and University restrictions, our general on campus meeting for the Fall of 2020 will not occur, but again be a virtual meeting. Considering the success of the Spring virtual meeting, this venue will allow the GSAB to continue its effectiveness with the DGS and University. In the event pandemic circumstances improve, we hope to have the timing of our fall meeting around a home football weekend.

History and Information About the GSAB and How to Help

Founded in 2002 the GSAB consists of membership from alumni, corporate, governmental, and community that are involved with activity related to the Department of Geosciences and its constituents. The purpose of the GSAB is to support students, faculty, and staff in the Department of Geological Sciences and serve as a liaison with the business community and government in order to promote the interests of the Department within the University of Alabama, the state, and the nation. A primary goal of the GSAB is also to help recruit and retain talented, competent, motivated students and faculty. This is accomplished by providing scholarships, employment opportunities for students, and support to retain talented faculty. Through membership contributions, and corporate matches with related contributions, the GSAB has raised and awarded over $400,000 that has supported over 300 scholarships to both undergraduate and graduate students in the Department of Geological Sciences.

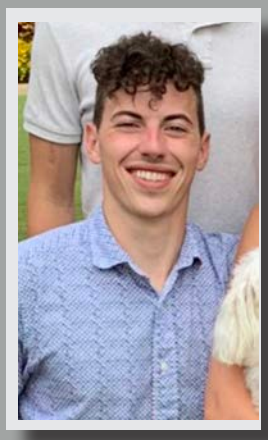
The GSAB holds two meetings annually. Under normal conditions, the GSAB meets in the fall on the University of Alabama campus on the Monday following a home Alabama football weekend, whereas in the spring, the GSAB commonly meets at a location where DGS related student research is taking place, or at a location where there is a concentration of Alabama alumni. These meetings are typically well attended by members and faculty, with students making presentations of their on-going research. Time is always provided for social events that allow student and GSAB member networking, as well as for field trips to research related or local areas of interest.

In addition to the scholarships funded directly from membership and corporate contributions, the Department of Geological Sciences has endowments valued at more than $3.6 million to benefit student scholarships and the faculty. Of these, the GSAB has recently led in the establishment of endowed scholarships valued at more than $670,000 to honor faculty and alumni leaders in the Department of Geological Sciences. These include the Douglas Jones - GSAB Endowed Scholarship, the GSAB-Hooks corpus, the Geological Sciences - Gary Hooks Scholarship Endowment, and the Thomas J. Joiner Endowed Scholarship in Geology. Together, these endowed scholarships currently generate more than $29,500 in funds to distribute to graduate and undergraduate students within the department. If you combine that to the nearly $25,000 plus on average available from membership and corporate contributions annually, the GSAB is intimately involved in the distribution of over $50,000 in scholarships to deserving and needy students pursuing degrees in the field of Geological Sciences.

If you have a desire to help with our efforts, we would love to have you join the GSAB. You do not have to be a graduate of the University of Alabama Department of Geological Sciences to join the Geological Sciences Advisory Board. Although the majority of the GSAB is composed of alumni of the Department of Geological Sciences, we currently have members of other disciplines such as law and engineering from government and industry representatives who never attended the University of Alabama. We also have members from faculty of other universities such as Auburn University.

If interested in joining or if you have questions regarding the GSAB and/or the Department of Geological Sciences at the University of Alabama, please direct those inquiries to Dr. Delores Robinson, Chair of the Department, at dmr@ua.edu, (205) 348-4034 or Ron Tisdale, GSAB chairperson, at rmttri@gmail.com, 205-352-3832.

Meet Our Graduate Students



Stephen Anderson

Ph.D. Student

My name is Stephen, and I am a 2nd year student in the Material Sciences tri-campus PhD STEM program for Alabama working with Prof. Natasha Dimova in the Geological Sciences department. I received my BS in Chemical Engineering from UA in 2019 and have been a lifetime fan of Alabama Football, Nintendo, and protecting the environment.

My work involves studying the deposition and movement of anthropogenic chemicals derived from Coal Fired Power Plants (CFPP) and how they travel throughout the Mobile watershed that encompasses most of the state. Using a combination of hydrological, geochemical, and mathematical processes, my research team is analyzing the geological formation and compositional differences of each of Alabama's main rivers, using their unique ^{226}Ra and ^{228}Ra isotope ratios along with historical ^{210}Pb and ^{137}Cs sedimentation rates, in order to produce spatial and temporal predictive models of how CFPP pollutants travel throughout Alabama! This work is done in the hope of improving upon environmental remediation efforts for the state through the means of more accurately determining areas of interest.

Mark Boyd

Masters Student

My name is Mark and I'm an MS student from the UK. I graduated from Durham University with a BSc in Natural Sciences (2019), and I'm currently studying in the Cartwright Cosmochemistry Laboratory, under the supervision of Dr Julia Cartwright. My research focuses on the high-resolution analysis of cosmic dust – tiny grains of extra-terrestrial material! I'm working with two sample sets: Antarctic micrometeorites, and interplanetary dust particles collected from the atmosphere by NASA. We are investigating chemical and textural features in these samples to compare the processes affecting them as they journey from outer space to the Earth, and better understand our planet's interaction with extra-terrestrial material.

I am passionate about planetary and space science outreach, having been involved in the department's *Geokids programme* and partnering with the Alabama Museum of Natural History for their *Night at the Museum* event, teaching young people about planetary motion using giant inflatable planets. I have been fortunate to be able to deepen my knowledge of space with a course in the Department of Physics and Astronomy here at UA, and living in a state with a rich history of space exploration only serves to grow my interests!

Ryan Culp

Masters Student

My name is Ryan Culp and I am from Encinitas, CA. I received my BS in geology from West Virginia University where I also received a GIS minor. I am a second-year masters student working with Dr. Matt Wielicki researching the K-Pg boundary here in Alabama. Unusual sand deposits formally called the Clayton sand bodies have been found separating Cretaceous and Paleogene rocks just southwest of here at a location called Moscow Landing. These sand bodies have been hypothesized to have been deposited by a tsunami generated by the Chicxulub impact. Detrital zircon geochronology can help answer questions about the formation of the Clayton sand bodies-what is their provenance, what is their relation to the overlying Clayton formation proper, and their origins regarding the Chicxulub impact. I submitted an abstract to present my research at the 2020 LPSC in Houston, but the conference was cancelled due to Covid-19. I am planning on submitting an abstract to GSA that will be held later this year. A fun fact is that this summer my girlfriend and I went on a 7000-mile road trip across the US. I had never done anything like that before and it was an amazing experience.

Jamkekia Durrough-Pritchard

Masters Student

Hi! I'm Jamekia Durrough-Pritchard and I am a second year master's student born and raised in Alabama. My roots are in Demopolis, AL and I finished middle and high school in Pelham, outside of Birmingham. I have a BS in Geology from UA and I hope to finish my masters degree by December 2020. My advisor is Dr. Fred Andrus and my research entails using nitrogen isotopes to assess pollution in streams. I am currently a hydrologist at the National Water Center where my focus is utilizing the National Water Model to forecast flash and riverine flooding across the country. Before working at the National Water Center, I was a hydrogeologist at the Geological Survey of Alabama for 3 years.

Jordan Faltys

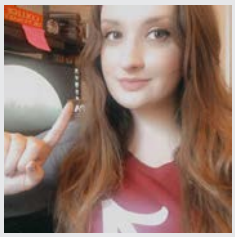
Ph.D. Candidate

Hi! My name is Jordan Faltys, and I am a fourth-year Ph.D. candidate studying under Dr. Wielicki. I received my BS in 2013 from New Mexico State University in Geological Sciences. Before grad school, I worked in the ultra-deepwater oil field as an engineer and as a geologist/data analyst before leaving for Alabama. My research focuses on lunar and terrestrial impact-formed zircon to answer questions about the bombardment history, crustal evolution, and habitability of Earth during the Hadean (first 500 Myr of Earth). Unfortunately, due to COVID, I was unable to present research on the geochemical stratification of terrestrial impact melts in New Delhi, India at the 36th International Geologic Congress. This research focuses on modeling the formation of a Hadean felsic crust through impacts. I will be returning to their postponed meeting next year! Over the Summer I was able to submit a manuscript entitled "Inclusions in impact-formed zircon as a tracer for target rock lithology: Implications for Hadean continental crust composition and abundance." This paper develops guidelines for using mineral inclusion proportions in terrestrial impact-formed zircon to determine a broad composition of unknown target rocks and was published in *Lithos*. This year I hope to continue working on publishing my second chapter and finish running and analyzing lunar zircon samples on the Local Electrode Atom Probe for my final dissertation chapter. When I have free time, I enjoy golfing and camping, when I am not spoiling my black lab, Moose.

Johnathan Frame

Ph.D. Student

I am Jonathan, and I am from California. Before starting here at UA I was working as a civil engineer doing water resources infrastructure design and maintenance along the west coast. I was (still am) also involved in stream restoration projects in the Los Angeles River Watershed. I completed my M.S. at UC Irvine back in 2011 where I studied Water Resources Engineering. During my PhD here at UA I have been working with Dr. Grey Nearing on machine learning applications for hydrology. We are working to develop global hydrological simulators with artificial intelligence. I currently have three papers in review, one as first author. I have also been a co-author on three conference papers. I have been working closely with the National Water Center here on the UA campus, and I hope to be able to contribute to the Next Generation National Water Model.



Alyssa Mills

Masters Student

My name is Alyssa Mills, and I am from Bel Air, Maryland, the state of blue crabs and jousting as the official state sport. I received my bachelor degrees in astronomy and geology from the University of Maryland in 2018. At University of Alabama, I study Ganymede's magnetic field under Dr. Alain Plattner. I am currently interning at NASA's Jet Propulsion Laboratory (JPL) remotely where I am working on investigation science about chaos terrain on Europa for Europa Clipper under the mission's principal investigator, Dr. Robert Pappalardo. Chaos terrain is interesting because it may be sites of recent or current geologic activity. Understanding chaos terrain, specifically the blocks inside, is crucial to understand the geological processes present on Europa, so my project is focused on these blocks. The interior blocks of chaos bear similarities to icebergs on Earth and could result from similar processes as iceberg calving, so I have been focusing on exploring fractures processes based on mapping observations I have done to compare to icebergs. The most interesting initial result is that preexisting tectonic fabric seem to influence chaos block orientations, perhaps indicating that chaos formation involves the exploitation of preexisting fractures. After completing this project we plan to present it at AGU and possibly GSA this year. When I am not working on science, I can be found playing board games (competing at the World Boardgaming Championship every year), exploring southern architecture, or enjoying nature and brushing up on my geology skills through rock identification.

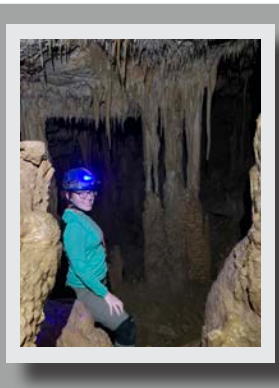
Rachel Mohr

Ph.D. Student

Hello! My name is Rachel Mohr and I'm originally from Minnesota. I got my BA in Geology at Gustavus Adolphus College, which is located in the valley of River Warren, which drained glacial Lake Agassiz. In 2016, I ventured south to Tuscaloosa and joined Dr. Tom Tobin's lab here at the University of Alabama, where I received my M.S. degree in geology in 2018.

For my master's thesis research, I conducted high-resolution sampling of *Lahillia larseni* bivalve shells from Antarctica to produce subannual records of oxygen and carbon isotopes across the Cretaceous-Paleogene boundary. After a lot of revisions, I along with several coauthors have finally published an article based on my master's research, which was accepted for publication in Geology this summer.

For my dissertation research, I'm using local museum collections to revise and refine the taxonomy and biostratigraphy of Late Cretaceous ammonoids in Alabama. I encounter a lot of interesting materials in the older parts of these fossil collections, such as handwritten labels written by early Alabamian paleontologists including E.A. Smith, T.H. Aldrich, and Winnie McGlamery. These labels inspired my presentation at GSA last year on methods for accurately transcribing historical handwritten labels and preserving the data they contain.



Bridget Murray

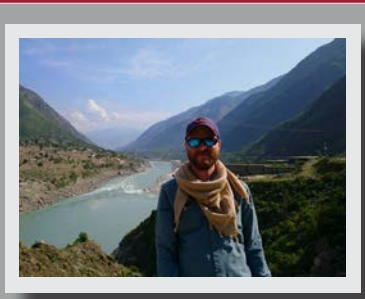
Masters Student

Roll Tide! My name is Bridget Murray and I am at the tail end of my Master's. I'm originally from the Philadelphia, PA area but work has bounced me around the country—Utah, Colorado, and, at the current moment, California. I received my BA in Anthropology and Linguistics from Bryn Mawr College in 2017 with a geoarchaeology concentration that has morphed into a love of geology. I'm co-advised by Drs. Tom Tobin and Joe Lambert for a thesis on spatial variation in stable isotope ratios during seasonal stalagmite growth, which will contribute towards the niche of paleoclimatology that uses cave formations to study past climates. I'm currently developing my knowledge of cave science and geological resource management as a seasonal Physical Science Technician for the National Park Service, and previously interned with the US Forest Service. When I'm not cooped up in the lab, I can be found continuing to avoid sunlight by hanging out underground, or soaking it up on backpacking, climbing, and river trips.

Mary Hastings Puckett

Ph.D. Student

My name is Mary Hastings Puckett and I am from a small town, Magnolia Springs, on the Alabama Gulf Coast. I received my BS in Geology from the College of Charleston and I am finishing up my Masters at UA while concurrently starting my PhD with Drs Tick and Zhang. My PhD research will focus on surface and groundwater interactions in Alabama rivers. In my two years at UA I have presented a Poster at Southeastern Geological Society of America 2019, an Oral Presentation Alabama Water Resources Conference and Symposium 2019, and a Poster at American Geophysical Union 2019. Since May 2019 I have interned at the Geological Survey of Alabama in the Groundwater Assessment Division. In August 2019 I published my first paper in *European Physical Journal Plus*, "Application of fractional differential equation to interpret the dynamics of dissolved heavy-metal uptake in streams at a wide range of scales."



Joel Schiffer

Ph.D. Student

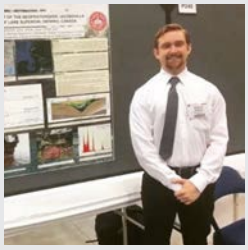
After a year and a half here, I think I've fully transitioned to life in Alabama. For those that don't know me, my journey has taken me to many places. I'm originally from Washington (state), but also lived in Texas for 7 years, where I got my BS at UT Arlington (2012). I then moved to Norway for two years to earn my MS at the University of Tromsø (2017), far north in the Arctic. Since that wasn't adventurous enough, in the Spring of 2019 I started work on my PhD here in Alabama! My current research is being advised by Dr. Robinson, and is titled, "Structural Evolution of the Himalayan Fold-Thrust Belt in Northern Pakistan: Insights from Geo- and Thermochronology". Using structural cross-sections and thermochronologic data, I will build thermokinematic models for how the fold-thrust belt in northern Pakistan has evolved through time. Last fall, Dr. Robinson and I were able to travel to Pakistan to complete field work and collect samples. It was a wonderful and eye-opening experience for me, and I enjoyed learning their culture and making new friends. I was very much looking forward to returing this year, but COVID-19 had other plans. Over the summer, the samples we collected have been processed and analyzed, giving me the data I need to complete my research. Now to figure out what it all means..

Sam Walker

Masters Student

Hello, my name is Sam Walker and I was born and raised on the Gulf Coast in Mobile, Alabama. In December 2015, I graduated from The University of Alabama with my Bachelor of Science in Geology. Shortly thereafter I decided to stay in Tuscaloosa and have been pursuing my Master's in Geology ever since! My master's thesis – under the co-advisement of Drs. Ibrahim Cemen and Matt Wielicki - currently focuses on the structural evolution of the Mississippi Embayment using geochronology and geochemical analyses of igneous dikes in Central Arkansas. We are working to combine age data, trace element and major oxide plots, and paleostress analysis in the form of rose diagrams to investigate the relationship between these dikes and the Embayment's evolution in Late Cretaceous time.

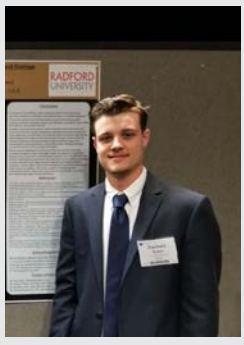
Besides being a graduate student, I have spent the last two summers as an ORISE Research Fellow with the Department of Energy's National Energy Technology Laboratory (NETL). My work there focused on applying Natural Language Processing to filter out geologic literature. Recently I have been involved with seismic interpretation in Petrel to advance their Subsurface Trend Analysis tool, which aims to delineate "domains," or areas with similar data trends, in the Gulf of Mexico.
When I'm not working, I can be found at Alabama football/basketball games, watching UFC fights, or hiking local trails.



Robert Wencel

Masters Student

My name is Rob Wencel and I am originally from Plainfield Illinois, a southwest suburb of Chicago. Much of my research interests so far have been focused around sedimentology and structural geology. In May of 2019 I completed a BS in geology from Illinois State University where I worked on a provenance study of the Jacobsville Sandstone. To do this I analyzed the the U-Pb ages of zircon grains obtained from the Jacobsville along the eastern shore of Lake Superior in Ontario, Canada. I am now entering the second year of my master's degree here at The University of Alabama where I am being advised by Dr. Ibrahim Cemen. For my thesis I am studying natural fracture patterns in the Woodford Shale located in the Arkoma Basin, Oklahoma. I am using terrestrial Light Detection and Ranging (LiDAR) in order to obtain high resolution images of two Woodford outcrops that have varying degrees of deformation. These LiDAR images will be used observe fracture spacing and density and how the fractures vary in areas where bedding thickness, silica content, and degree of deformation vary. When I complete my MS I hope to work in the oil industry but would love to come back and begin a PhD sometime in the future!



Zach Yates

Masters Student

My name is Zach Yates and I am from Cedar Bluff, Virginia, a small town in central Appalachia. I completed my B.S. in Geology at Radford University in 2018 and worked as a geologist for a coal mining company in Brookwood, Alabama after graduating. Now I am working on my M.S. with Dr. Delores Robinson here at UA. My thesis research is focused on using detrital zircon geochronology and sedimentary petrography to determine the provenance of sedimentary rocks in the Black Warrior basin and Cumberland Plateau. During Carboniferous time, the Ouachita and Alleghanian orogenies were occurring adjacent to one another in what is now SE North America. The spatial extent of sediment shed from these mountain chains is not well understood and the sources of the resulting sedimentary rocks in northern Alabama are debated. I plan to use new detrital zircon quantification techniques to shed light on the source of these sedimentary rocks and help advance our understanding of late Paleozoic tectonism. Outside of my research, I spend most of my time playing with my dog Charlie, reading non-fiction books, exercising, and playing golf.

Welcome Our New Graduate Students!

Name
Mary Scott Huettemann ("Mary Brandon")
Degree sought? Who is your advisor? Where did you go before Alabama?
MS student under Dr. Tick, I received my BS from the University of South Alabama
What made you choose Alabama?
I chose Alabama because when I came to visit I really liked the program they had to offer.
What are you looking forward to in grad school?
I am looking forward to continuing to learn and conduct research. I am also looking forward to meeting everyone within my program!
Interesting Fact about yourself
I worked on a dude ranch in Wyoming for three summers.

Name
Ramon Richardson Jr.
Degree sought? Who is your advisor? Where did you go before Alabama?
Ph.D. under Dr. Plattner. I Graduated with a B.S. from Mississippi State University Spring 2020
What made you choose Alabama?
I chose The University of Alabama over my other options because the faculty, staff, and students made me feel a part of the crew when I toured. I was given options of what I could study and was not limited. I realized that my creativeness, weakness, and strengths would all be embarrassed, allowing me to succeed.
What are you looking forward to in grad school?
I am really looking forward to spinning around in a chair as I wait for the workstation to compute my research.
Interesting Fact about yourself
I absolutely love space… yet I have an irrational fear of extraterrestrials. Due to watching horror movies, I should not have as a child and the darn History and Discovery channel. You can find me saying Aliens are not real but if they are, I do not care if they come in peace, I will mess them up. I do love Sci-Fi if it is not a horror Sci-Fi.

Name
Jessie McCraw
Degree sought? Who is your advisor? Where did you go before Alabama?
I'm a PhD student starting at Alabama in the Spring of 2021, advised by Tom Tobin. I received my MS from Syracuse University and my BS from the University of Arizona, both in earth sciences with emphases in Earth Systems and Paleobiology.
What made you choose Alabama?
I chose Alabama because of the quality of my advisor and the analytical research opportunities there.
What are you looking forward to in grad school?
I'm looking forward to working on projects I'm excited about.
Interesting Fact about yourself
I'm currently working a Geoscientists-in-the-Parks intern at Badlands National Park through the fall.

Name

William Clark

Degree sought? Who is your advisor? Where did you go before Alabama?

Seeking a PhD under Dr. Rebecca Minzoni. I got a BA at University of South Alabama in 2012, and a MS from the University of Nebraska-Lincoln in 2018.

What made you choose Alabama?

I chose Alabama because of the opportunities the geology department provides and after meeting with an awesome advisor. Since I started grad school with my MS at UNL I've met a lot of advisors. You have to be smart when you pick them, because a poor advisor can kill your graduate experience. Dr. Minzoni is one of the best.

What are you looking forward to in grad school?

I am most looking forward to building connections with fellow grad students, and with academic and industry colleagues. I'm thrilled to have the opportunity to expand my geology knowledge beyond micropaleontology. I'm also excited to work in a department that has access to excellent laboratories and equipment. I mean have you seen the front entrance? TWO Scanning Electron Microscopes and an Atom Mapper?

Interesting Fact about yourself

I started out as a drama student. Got a double major in English and Theater for my BA. I was one of THOSE kids! I wrote a 3 act play as a departmental honors thesis. Then I graduated to make my millions as a famous actor. Obviously, I ran into some roadblocks.

Name

Chaloemporn Ponprasit (Chloe)

Degree sought? Who is your advisor? Where did you go before Alabama?

MS student under Dr. Yong Zhang. 2018 ,Bachelor of Science, Chulalongkorn University, Thailand

What made you choose Alabama?

Top national university in the U.S., friendly and helpful professor and great environment.

What are you looking forward to in grad school?

I am ENFP personality types and easy-going person. I am passionate about fitness and travel. I care about social and gender equality

Interesting Fact about yourself

I'm currently working a Geoscientists-in-the-Parks intern at Badlands National Park through the fall.

Name

Logan Qualls

Degree sought? Who is your advisor? Where did you go before Alabama?

MS student under Dr. Nearing. I got my BS in geology at the University of Tennessee

What made you choose Alabama?

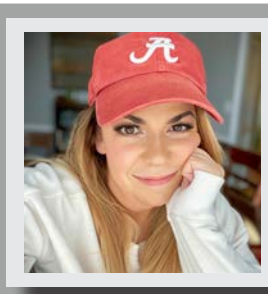
I visited as senior in high school and remember thinking it was a beautiful place with a powerful on-campus presence. The active and healthy geosciences and graduate communities have also been a driving factor in my decision to attend UA.

What are you looking forward to in grad school?

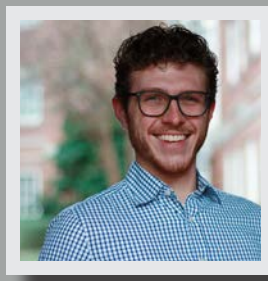
I'm looking forward to performing research I consider to be important and impactful, developing new skills and perspectives, as well as networking.

Interesting Fact about yourself

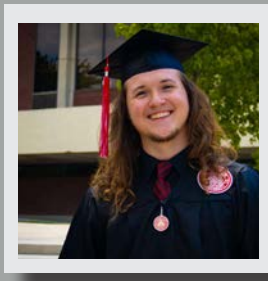
I was able to attend field camp in the birthplace of geology: Scotland! I also have a female bearded dragon named Gibson. She is a very good girl.



Name
Samantha (Sam) Stanford
Degree sought? Who is your advisor? Where did you go before Alabama?
Ph.D. student under Dr. Tom Tobin. 2018
What made you choose Alabama?
UA will allow me to continue research of fossil marine invertebrates and add to the database of paleo-ecology in exciting new ways that are outside my comfort zone.
What are you looking forward to in grad school?
I'm most looking forward to diving back into academia after a several year hiatus.
Interesting Fact about yourself
I once gave an interview to NPR's All Things Considered about fossilized poop.



Name
Adrian Wiggins
Degree sought? Who is your advisor? Where did you go before Alabama?
MS student under Drs. Çemen and Tick. I earned a B.S. in Geology and a B.S. in Chemical Engineering from the University of Alabama in May 2020.
What made you choose Alabama?
To start, I am familiar with the city of Tuscaloosa and the college campus because I attended Bama for undergrad. Furthermore, Alabama offers great opportunities for research and my advisors' willingness to help me with a custom Masters project solidified my decision.
What are you looking forward to in grad school?
Learning even more about geology and making friends with like-minded students
Interesting Fact about yourself
I play about six instruments and love music!



Name
Steven Young Jr.
Degree sought? Who is your advisor? Where did you go before Alabama?
MS student under Dr. Rona Donahoe. I earned a B.S. Illinois State University
What made you choose Alabama?
I was excited to travel to a part of the country I've never been and be a part of such a solid geology department.
What are you looking forward to in grad school?
Meeting new people, having new experiences, and learning new things.
Interesting Fact about yourself
I learned how to blow glass in my undergrad

DepartmentHighlights!!

- Students and faculty again set a record in peer-reviewed publications, both in terms of overall numbers and per capita.
- Faculty published a record 95 peer-reviewed articles and chapters
- Students published a record 19 peer-reviewed papers.
- We published in top journals, including Science Advances, Proceedings of the National Academy of Sciences, and Geology.
- Collectively, faculty, graduate students, and majors published 150 conference abstracts - another new record.
- We won nearly $2,000,000 in external funding last fiscal year and have already brought in about $1,200,000 so far in the current year, the best in over a decade since before the energy collapse.
- Our funding is coming from a wide array of sources, including NSF, NASA, USGS, UA-AID, UCAR, State of Alabama, private foundations, and several companies as part of three new corporate partnerships.
- We have more Ph.D. students than ever, even as we maintain a large MS program, and they are graduating and going on to great careers.
- Our alumni include leaders of industry, top researchers, and influential government officials, and they actively support our students and faculty through our Advisory Board and individual actions.
- We have over 80 majors and are growing.
- Our majors all take part in hands on field and lab education and research.
- We taught nearly a record number of credit hours, increasing by 8% this year, even as University enrollment was level or declining.
- Our students at all levels are winning awards such as NSF (Asmara Lehrman and Victoria Fitzgerald) and NOAA (Christine Bassett) Fellowships, competitive internships, and external research grants.
- Our faculty include two NSF (Sam Hansen and Kim Genareau) and one NASA (Alain Plattner) Early Career award winners, plus a Google Visiting Researcher (Grey Nearing).
- Students and faculty work worldwide on every continent and nearly all ocean basins. We offer two new study abroad classes in the Bahamas and China, plus our field course in New Mexico.
- We responded to COVID 19 by moving 111 classes and lab sections online in a matter of a couple of weeks and our students adapted gracefully and successfully.
- Enrollment growth continues even in light of the decline in overall college attendance due to COVID.
- We are becoming more diverse and students and faculty are coming together now to try and become more welcoming to all, with creative ideas and positive spirits.

Thank you for all of your contributions to this Fall 2020 Newsletter! We will see you all next year!

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Department of Geological Sciences