

eGEOTIGER

January 2022

New Faces



Jake Nelson
Assistant Professor



Bonnie Bounds
Lecturer



Edna Fernandez-Figueroa
Postdoctoral Fellow



Dr. Murat Atasoy
Postdoctoral Fellow

Highlights Inside This Issue

- | | |
|---|---|
| Greetings from the Chair, p. 2 | Planetary Geology Research p. 21 |
| NSF AU Contaminants Lab p. 3 –4 | Geoscience Welcome Back Event p. 22 |
| Climate Change Awareness/Outreach p. 5 –7 | First Postdoctoral Symposium/3MT Comp. p.23 |
| Earth Day Extravaganza p. 8-12 | New Faces/ Faculty/Staff /Retirees p. 24-35 |
| Field Trips p. 13– 14 | Departmental Awards and Recognitions p.36-40 |
| Summer Book Club p. 15 | Student Scholarships and Back to Travels p. 41-43 |
| <i>Summer Immersion Experience</i> p. 16 | Daniel Leaphart makes grandfather proud p. 44 |
| FAMU Recruitment/ Awareness Fair p. 17-18 | Minor in Geography p. 45 |
| Current Research and Fieldwork p. 19-20 | Invest in Geoscience, p. 46 |

eGeotiger

Greetings from the Chair!

It has been a great honor for me to serve as the department chair since 2018. This is my 27th year as a member of this great Geosciences family, and it has been a great joy to live my life surrounded by such extraordinary faculty, students, staff, alumni, and friends. Ideas have long sparked along the hallways, in the meeting rooms, and from the Geosciences Advisory Board (GAB) to move the department forward. We are all happy that we are returning and interacting with everyone face-to-face since August of 2021. We are a social species that are more productive by being around other smart and caring individuals.



Our faculty continue to study and teach a wide range of exciting topics on Earth's dynamic processes and their interactions with humans. What drives and motivates the growth of our discipline is the societal needs for well-trained earth scientists to investigate natural resources, natural disasters, as well as change and stress in Earth's environmental systems upon which we all depend. A degree in Geology or Geography provides excellent preparation for many exciting careers for undergraduates, tailored to their individual educational, career, and professional needs. Our graduate students write fascinating theses on an incredibly broad set of topics within or spanning boundaries among various Geology,

Geography, and Earth System Science disciplines. The grand opening of the Academic Classroom and Laboratory Complex (ACLC) Building in Fall 2022 will allow us to teach our undergraduate labs in modern instructional facilities. The new \$165M STEM-Ag building project to house six COSAM and Agriculture departments, including both Geology and Geography, would facilitate more research collaboration and sharing of resources in 2025 and beyond.

Our department is quite fortunate to have a diverse body of first-rate graduate students not only from the United States but from overseas. Our department is even more fortunate that its faculty and students have long treated that diversity, inclusion, and equity as an asset to be nurtured. The funds provided by the GAB and Tigers Giving Day project has enhanced our efforts in increasing the diversity of student cohort.

We invite you to learn more about our outstanding degree and professional certificate programs in the Department of Geosciences. Please feel free to contact me or other faculty to help answer any questions you might have. We look forward to hearing from you or meeting with you in departmental events.



Auburn receives \$100K from NSF to upgrade instrumentation to detect environmental contaminants by Maria Gebhardt

Auburn University will have its first gas chromatograph and thermal combustion oven coupled with an isotope ratio mass spectrometer.

So, what is that exactly?

For [Ann Ojeda](#) in Auburn's Department of Geosciences, this new instrument will help her research on soil and water contaminants.



long we can expect the compounds to remain in the environment.

"The Department of Geosciences currently has an isotope ratio mass spectrometer that detects carbon, nitrogen and oxygen signatures. With this \$110,081 grant from the National Science Foundation, our university now has the ability to analyze carbon and hydrogen signatures of organic compounds on this spectrometer instead of sending them to external facilities," Ojeda said.

The equipment will be installed for research use this fall. It was Ojeda's first grant from the National Science Foundation (NSF) and she explains that the best part of this grant was the opportunity to work with the Auburn Family.

"It was encouraging that people at Auburn were always willing to help new faculty like me," she said. "I reached out and gained support across disciplines at this university that directly contributed to the success of this grant."

Ojeda found the help within the College of Sciences and Mathematics (COSAM) to be very beneficial.

"In COSAM, the grants and processing administration staff helped me make sure that I submitted everything on time," Ojeda explained. "It is very powerful to me see these teams come together to elevate research at Auburn University."

"I apply and develop new methods to understand how contaminants behave in the environment," said Ojeda. "I will be looking at toxic compounds in both water and soil to learn more about where these compounds come from and how long it will take them to degrade in the environment."

The equipment is the first one at Auburn University and one of just a small number of universities in the South.

"My research has real-world applications for risk assessment, site and water management across the nation," Ojeda added.

AU CONTAMINANTS LAB

Dr. Ann Ojeda



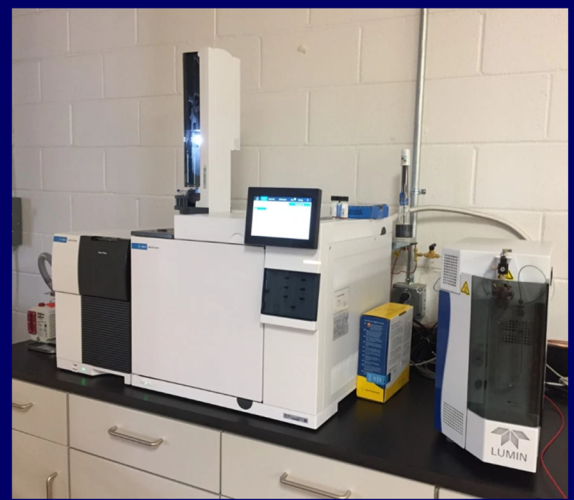
@geochemlab

Tracing sewage releases in freshwater

Transformations and toxicity of organic compounds

Metal-DOM interactions

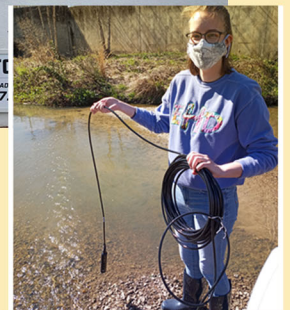
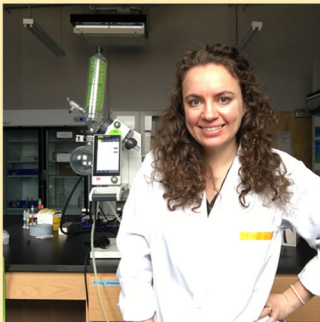
AU Contaminants Lab



Some of our tools

BEMC 2092, 2110B

These instruments detect organic compounds in soil and water



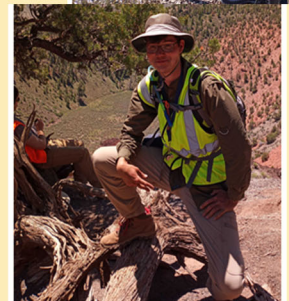
Our Team

Graduate:

Caitlyn Herron (MS, Geology)
Ella Larson (MS, Geology)
Andrew Gibson (MS, Geology)
Anika Hoque (PhD, ESS)

Undergraduate:

Zaln Webb (Senior, Geology & Biochemistry)
Emma Henderson (Senior, Geology)
Sidney Milner (Senior, Environmental Science)
Postdoc
Natalia Malina

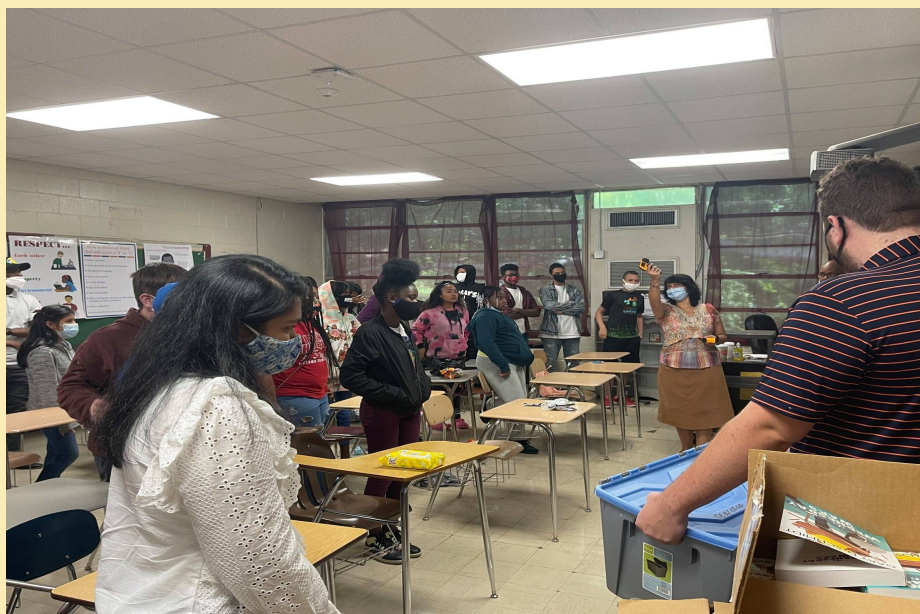


Bringing Climate Change Awareness to Middle School



Dr. Mitra and her graduate students demonstrate various activities about climate change and bring awareness to the students at Highland Middle School, Union Springs, and Bullock County, Alabama.

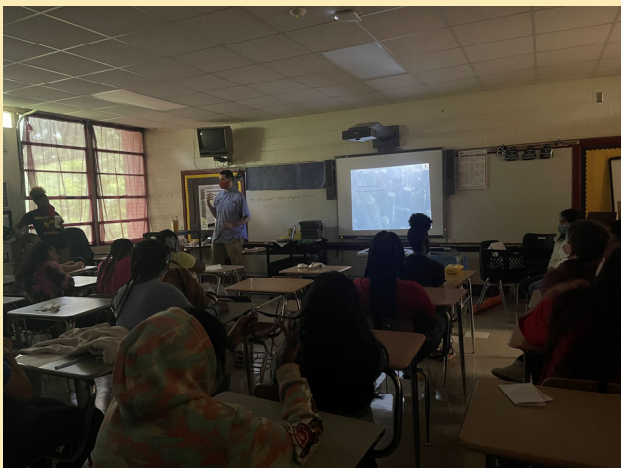
Activity performed by AlabamaView and urbanPRism lab, Geosciences.



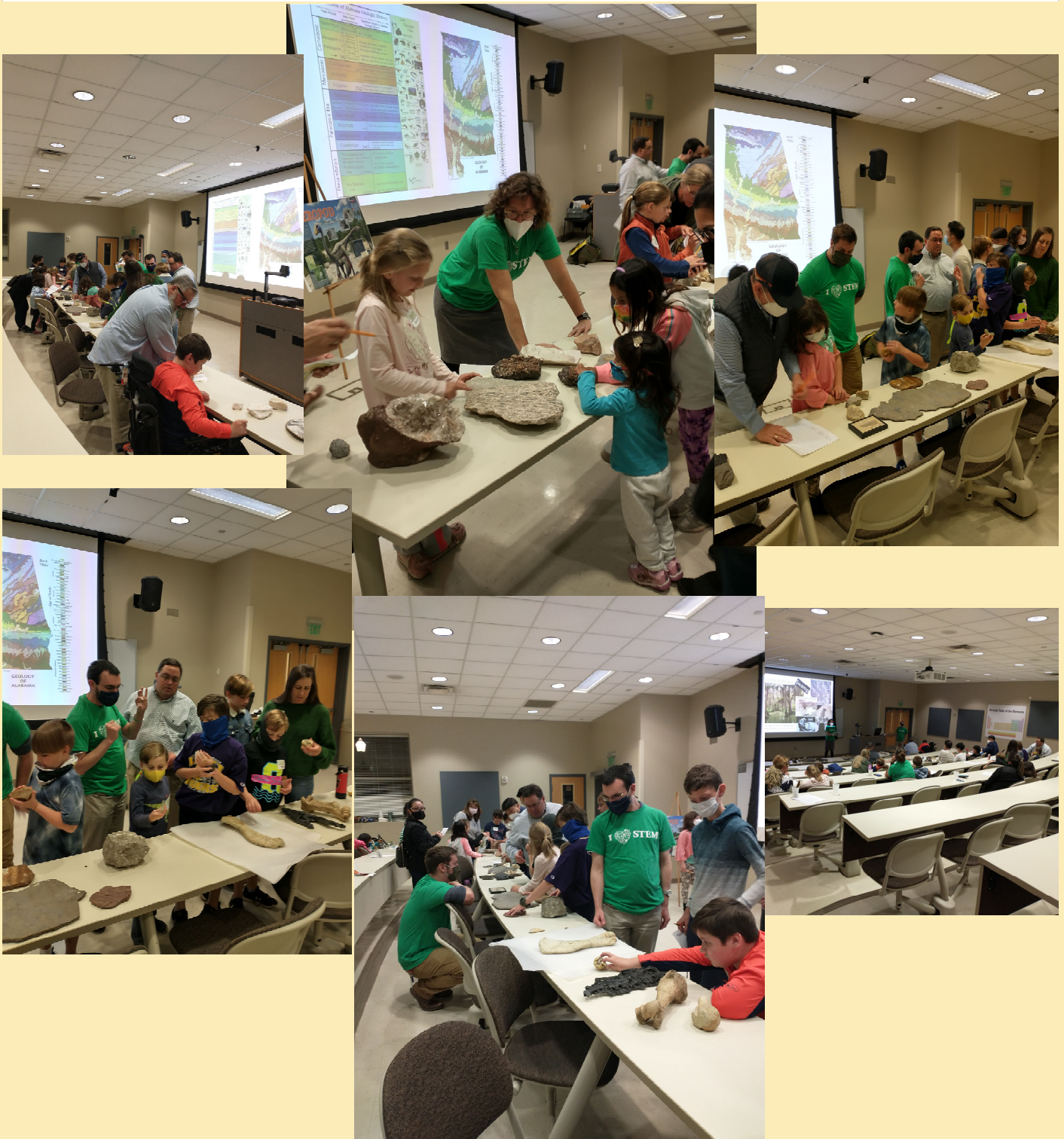
Climate Change Awareness



The students did various activities such as using handheld temperature thermometers to understand how different materials and surfaces reflect and absorb heat.

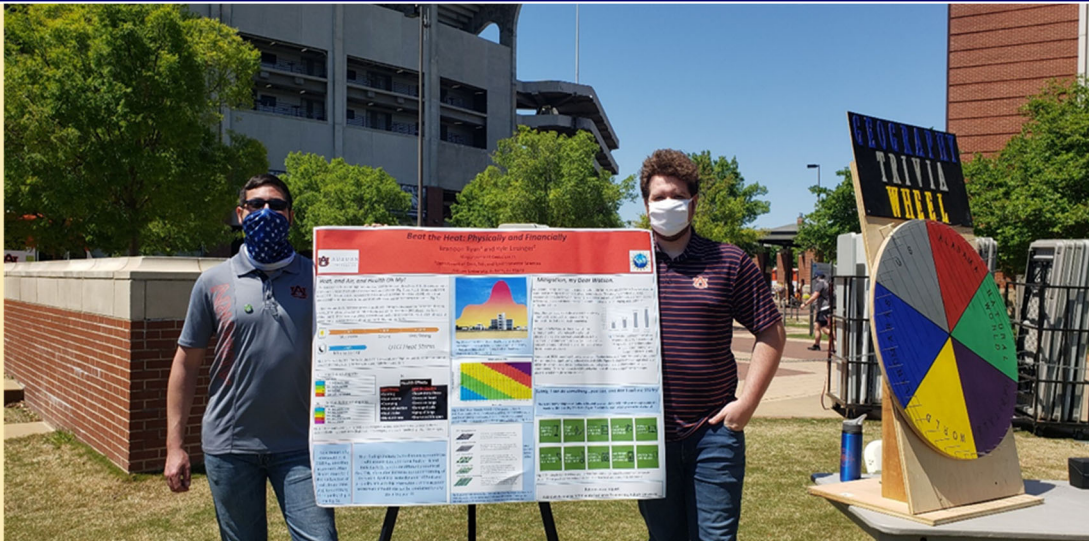


GUTS COSAM Outreach



John Fronimos, Bishop Robbins, and Marilyn Vogel did a GUTS (Getting Under The Surface) session for COSAM Outreach. It was called "Why Did the Dinosaur Live in Alabama?" which featured real dinosaur eggs and other fossils and rocks from the departmental collection. There were seventeen youths and much learning transpired.

Earth Day Extravaganza



Picture caption Kyle Lesinger and Brandon Ryan, presenting a poster about Urban Heat and thermal comfort.

Earth Day Extravaganza is an event celebrating Earth Day to raise awareness of sustainable practices through food, activities, and open conversations. This event was a huge success, thanks to the University Program Council, the Department of Geosciences, the Office of Sustainability, and the Waste Reduction and Recycling Department. This event gives faculty and students the opportunity to showcase their research relating to climate change and to educate attendees.



Tony Hall, Dr. Lee, and Dr. Rogers participating in Earth Day Trivia where goodies were given away.



Poster presentation demonstrating Air Pollution

Earth Day Awareness Event

Recycle, Reduce, Reuse

NRT OUTREACH EVENTS

Earth Day Awareness was an excellent way to share with the community climate-based education while promoting conservation. The location of this event was at the Davis Arboretum in a beautiful natural setting with perfect weather.

Many environmentally-friendly topics were demonstrated on the Jumbotron. The attendees could play games, build crafts out of recycled materials, talk to scientists, touch endangered animals and learn about climate specific topics.

One of the main objectives of Auburn and the state of Alabama's first NSF Research Traineeship on Climate Resilience is to develop the Trainees to effectively communicate scientific information to stakeholder and public audiences. Well Spring 2021 was choked-full of opportunities for them to hone these important skills. First the Trainees presented their research for the professional science community at the Southeast Geological Society Association (SE GSA) Regional Meeting. Then spoke to fellow students and faculty at the Earth Day event in an outdoor poster presentation. Then on April 23rd, the AU NRT with COSAM Outreach office hosted a Conservation Day in the Donald E Davis Arboretum with over 100 people in attendance to educate community K-5th grade children and families on conservation practices.

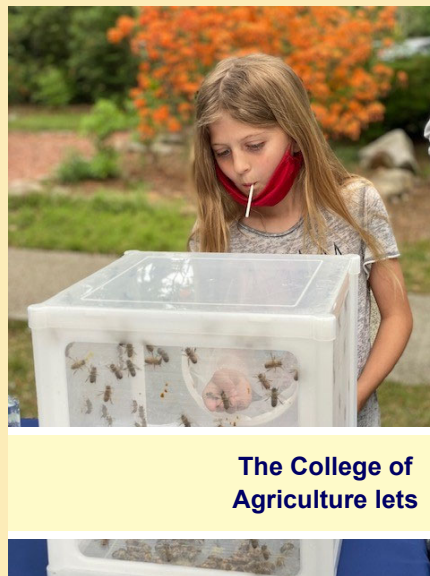
The Trainees wore large buttons with Icons reading "Ask Me About My Superpower" to start up conversations with the children about their research and the climate problems they are trying to help solve. The event was a success and will be repeated Spring 2022 with the next cohort of Trainees to further develop their science communication skills.



Recycling (GEOSCIENCES)



Toni Bruner with the AU MUSEUM OF NATURAL HISTORY shows off the endangered Indigo snake.

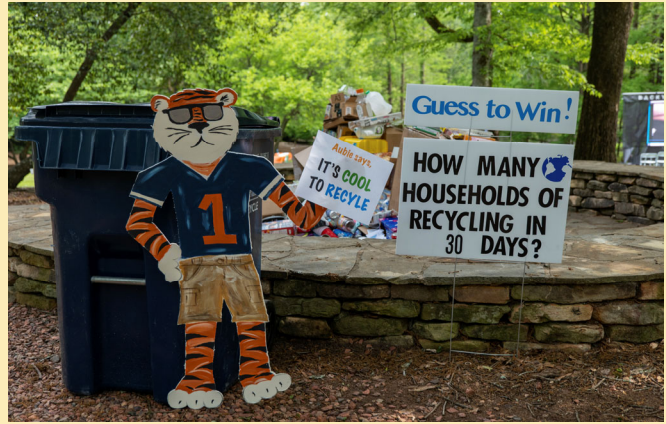


The College of Agriculture lets



COSAM STEM Robotics

Earth Day Awareness Event (continued)



The Earth Day Awareness event was a big hit! Various organizations such as the AU Museum of Natural History (endangered species), Alabama Water Watch (pollution and macroinvertebrates), Forestry and Wildlife (invasive species), and Geosciences (recycling).

Earth Day Extravaganza

The Earth Day Extravaganza held on April 22 celebrated Earth Day to raise awareness of sustainable practices through food, activities and open conversation.

This event was hosted by the University Program Council, Department of Geosciences, the Office of Sustainability and the Waste Reduction and Recycling Department.

Sarah Hamilton, director of the Academic Sustainability Program, provided an overview of the history and significance of earth day. Following Hamilton's introduction, an informal panel of faculty answered students' questions about sustainability and environmental issues.

The students showcased their research that related to climate change and the environment as well as educating attendees.

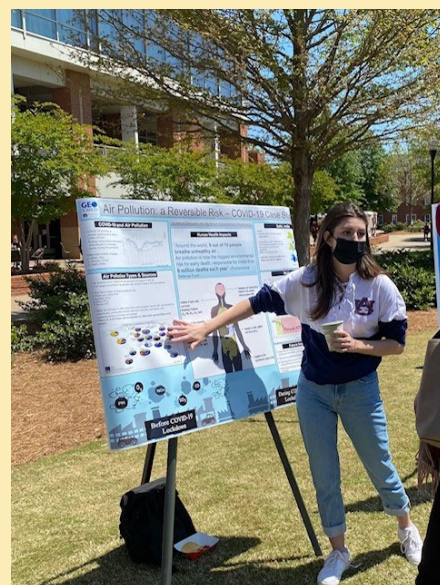
The Department of Geosciences flew a drone to demonstrate how pictures of the earth are taken. Earth Day Trivia, Poster Presentations, and fun giveaways were also popular at this event.



Tony Hall, one of the departmental certified drone pilots, demonstrates the flight of the drone.



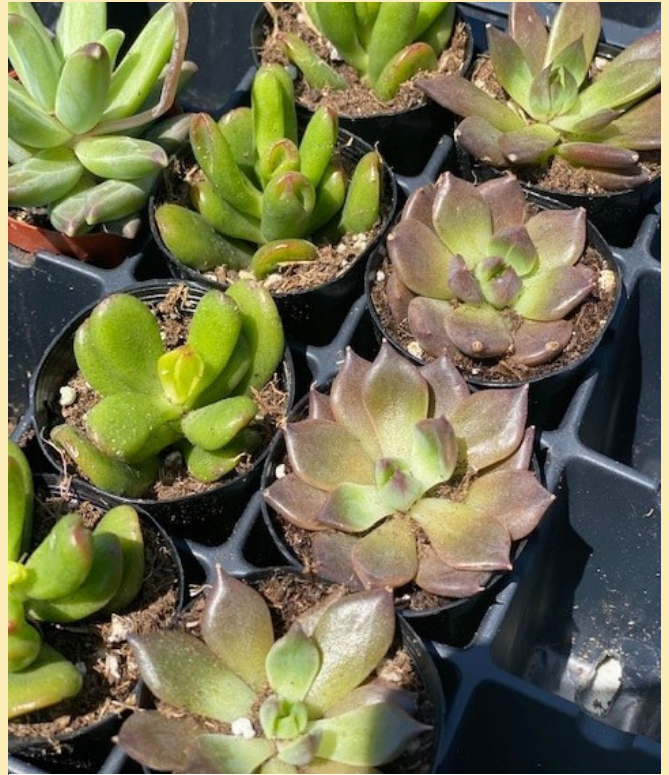
Adam Payne and Lauren Dickerson having fun with the Trivia Wheel.



Earth Day Extravaganza (continued)

Chandana Mitra, associate professor in the Department of Geosciences and one of the organizers of this event, said she hopes students will become educated about sustainable practices like reducing plastic consumption, using less paper, and minimizing consumption of animal products like meat and dairy. Dr. Mitra, is hopeful that students can learn from past generations' mistakes and take action towards protecting our planet. "The Earth has silently taken the brunt of human activity and we are now starting to see effects of this like extreme weather, climate change, and the extinction of plants and animals," she said.

Locally Sourced Shrimp Tacos



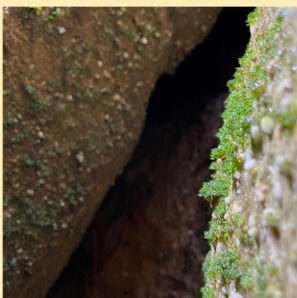
Succulent Workshop

A succulent workshop was held, where students could pot their own succulents to take home. Other activities included matching a country with their carbon dioxide emissions to balance the scale, a felt board to help students actively learn about how our actions have consequences on the planet and locally sourced shrimp tacos and basil were served.

The Office of Sustainability organized activities that all tie into education about environmental issues we face today. Jennifer Morse, Outreach and Communications Manager at the Office of Sustainability, said the purpose of this event is not just to have a good time, but also to become more educated about sustainable practices, climate change and Earth Day.

Dr. Vogel's Field Trip to Lookout Mountain

"Dr. Marilyn Vogel and ESS major Noah Yawn work on their forthcoming GSA virtual field trip "Alabama Botany for Rock Jocks" (SEGSA April 4 10 AM). As part of the project, they have visited and filmed several Alabama sites where the geology creates unique habitats for rare endemic plants that will only live on a given rock type or geomorphic feature. All departmental safety protocols + local/state regs followed, and all necessary permits were obtained. See here for a virtual abstract of the field trip: <https://www.youtube.com/watch?v=lxpsSRbRG3k>



Paleobiology Field Trip to Catoma Creek, Montgomery, AL



A field trip to Catoma Creek in Montgomery, AL. The students were learning how to find, collect, and identify Cretaceous marine fossils, as well as using them to reconstruct the ancient environment.

Back row (standing), left to right: Will Glisson, Kylie Mayes, Dominic Self, Kerstin Glaser, Emma Henderson, Lauren Talkington, Noah Yawn Front row (seated), left to right: Hannah Hornsby, Jess Pack, Jordan Harrison

Summer Book Club

During the summer semester, the interdisciplinary NSF Research Traineeship (NRT) program relaxes on its required courses and workshops to allow the Trainees more time to focus on their climate related research, such as “Enhancing climate communication through eye-tracking” Geoscience grad student, Haven Cashwell and “Flash drought variability via multi-index comparison” for Crop, Soil and Environmental Science grad student, Kyle Lesinger. However, in efforts to remain engaged throughout the summer the NRT faculty and Trainees started a book study and discussion on local and global activist Catherine Coleman Flowers’s book Waste: One Woman’s Fight Against America’s Dirty Secret.

The book is about a very determined Alabama woman, the author, and sanitation problems in rural Lowndes County in AL comparing it to other parts of the US and globe. The summer NRT series created in-dept conversations about Alabama’s sustainability and environmental justice. It also showed how one person’s determination and tenacity can make a difference on a global scale, no matter how humble their beginnings. The NRT program is now partnering with the Office of Sustainability to bring the author and environmental activist, Coleman-Flowers to speak publicly at Auburn University spring 2022,



then follow up with related classes in Human Sciences, the NRT Trainees, Water researchers at Auburn and AU’s Health Disparities Research Initiative committee. Another example of how a small beginning can blossom into future opportunities. More to come on Catherine Coleman-Flowers AU speaking event.



Summer Immersion Experience



Auburn's NSF Research Traineeship (NRT) program on Climate Resilience kicked off another year with a 5-day Immersion and Field Intensive this August before classes began with their 2nd cohort of interdisciplinary graduate students. The program now has 13 designated NSF Trainees from a range of AU depts including Geosciences, Agriculture, Crop Soil and Environmental Sciences, Forestry and Wildlife Sciences and Civil Engineering. The Immersion and Intensive is appropriately named because of the robust amount of climate related topics taught and discussed within the event from science professionals including experts from NOAA, USGS, state climatologists and the Southeast Climate Adaptation Science Center (SE CASC). In addition to giving the Trainees an enriched intro into climate related issues there is an equally important goal to have the Trainees network with similarly climate-interested graduate students from other institutions including NC State University, University of Tennessee, Duke, Florida State University, and HBCUs, FAMU and Savannah State.



The Field Intensive topics were held hybrid with the other institutions, but Auburn Trainees were face to face on campus. Thus, they were also able to incorporate some fun and informative elements in person with a group bike ride

to see some of

AU's water initiative projects on campus and an urban heat application, a hike and an AU scavenger hunt. One trainee shared, "I enjoyed being able to see what careers are out there as far as how people in different fields are fighting climate change. I enjoyed bonding with the other NRT trainees and socializing with them. I found many of the talks interesting and informative and saw how much climate change affects others. I feel like I was exposed to many different topics that I would have not been exposed to otherwise."

FAMU Graduate School Recruitment Fair and Haley Concourse

Katie Brown, Program Coordinator for the Department of Geoscience NRT program, recruits interested upperclassmen of FAMU of Auburn's NSF Traineeship Program.

Katie was part of a team from the College of Sciences and Mathematics (COSAM), Auburn's Graduate School and Auburn's Harbert School of Business that represented Auburn University that attended the 34th Annual Graduate Feeder Recruitment Fair at Florida Agriculture and Mechanical University (FAMU) on September 8 and 9 in Tallahassee, FL.



Haley Concourse Recruitment Fair


Geography Awareness Fair



Geography Awareness Week (GAW) promotes what geography is, why it is important, and the relevance of a geographic education in preparing citizens to understand pressing social and environmental issues and problems.



To celebrate this important week, the GSO held a public event. This event displayed research, a virtual tour, games, prizes, and more!



GEOGRAPHY AWARENESS FAIR

Thursday, Sept. 16th
10:30am-1pm
Haley Center East Atrium

Come learn about:
Geography major, minor, and certificates
Geography faculty and advisors
Instruments used in research
Growing career field opportunities

CASE RUE Research Symposium and Field Work



Gulf Coast Lignite in Arkansas



Sophia Saucedo, practicing using a depth integrated water sampler for measuring Total Suspended Solids in the pond at Ag Heritage Park.

Analysis of Water Quality in Parkerson Mill Creek

Kerstin Glaser and Ann Ojeda

The headwaters of Parkerson Mill Creek are on the Auburn University campus, near Beard-Eaves Coliseum and Donahue Street in Auburn, Alabama. Parkerson Mill Creek flows south through Auburn until it reaches a confluence with Chewacla Creek, south of the Chewacla State Park. Parkerson Mill Creek is on the Alabama Department of Environmental Management 303 (d) list of impaired water bodies, meaning the creek does not meet water quality standards. Poor water quality in Parkerson Mill Creek could lead to poor water quality in downstream waterbodies as well. Our goal was to measure the spatial distribution of water quality and pesticide/herbicide concentrations along the creek to determine sources of contamination.

Sample sites were selected north and south of the Chewacla Creek —Parkerson Mill Creek confluence to compare variation in water quality (Figure 1). One of the sample sites was also selected in close proximity to Auburn's wastewater treatment plant outfall into Parkerson Mill Creek. Samples were collected on 03/06/2021 and 04/09/2021.

A YSI Multi-probe™ was used to collect in situ water quality data, such as pH, temperature, conductivity, and dissolved oxygen (DO). At each site 500 milliliters of water were collected and sent to the Pesticide Residue Laboratory and screened for atrazine, acetochlor, bifenthrin, diazinon, ethalfuralin, fipronil, and alathion. These compounds were selected due to their prevalence in nearby areas conducted in a similar study (Glinski et al., 2018) and for their potential dangers to the environment and public health when above Environmental Protection Agency (EPA) standards. One to two milliliters were taken from each sample bottle for E. coli enumeration using Coliscan Easyger.



Parkerson Mill Creek Picture by Ann Ojeda

The results of our study are summarized in Table 1. No pesticides were detected throughout the course of this study by either our contaminants laboratory or the Pesticide Residue Laboratory. Water at all sample sites was well oxygenated, with dissolved oxygen concentrations ranging from 10.2 to 13.21 mg/L. However, the E. coli concentration in the water at site 1 was well above the maximum limit of 235 colony forming units/ 100 mL. This result could be due to areas of construction or agricultural runoff that we observed are upstream of site 1. Sample sites 3, 6, 4 and 5 have lower E. coli concentrations that meet the water quality criteria. All of these sites are located after the wastewater treatment outfall, which suggests the stream water is diluted by the treated effluent from the plant. The effects of the effluent are also reflected in other data collected. For example, we observed an increase in temperature and conductivity immediately after the outfall (site 3), then a slow decrease in those parameters further downstream (sites 6, 4 and 5). Together, these data suggest that the wastewater treatment plant does impact water quality, but it is not a source of E. coli in this stream segment. Our results suggest that future studies should focus on upstream sources of E. coli to pinpoint areas of poor water quality along Parkerson Mill Creek.

Statement of Research Advisor

Kerstin's project took a couple of unforeseen twists and turns because of travel restrictions associated with the COVID-19 pandemic. She persevered and was able to readjust her project to focus on Parkerson Mill Creek, here in Auburn. Throughout her fellowship term, she learned skills in geographic information systems, water quality measurements, contamination dynamics. She also practiced her presentation skills by sharing her work in our lab group meetings. Overall, her study helps us understand the impact of the wastewater treatment effluent on water quality in Parkerson Mill Creek, and it has helped us narrow the focus of future research to upstream sources of E. coli contamination. - Ann Ojeda, Geosciences

References

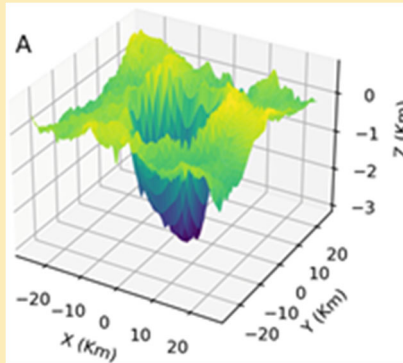
Glinski, D.A., Purucker, S.T., Van Meter, R.J., Black, M.C., Henderson, W.M., 2018. Analysis of pesticides in surface water, stemflow, and throughfall in an agricultural area in South Georgia, USA. *Chemosphere* 209, 496—507.

<https://doi.org/10.1016/j.chemosphere.2018.06.116>

Current Planetary Geology Research

Hephzibah Christopher (M.S.): Topography modeling of craters on Ceres

I am investigating the degradation and viscous decay processes that affect smaller impact craters on Ceres by analyzing their topographies (Fig. A). Assessing the degree of degradation of Cerean craters will imply about its evolution as a volatile-rich body.

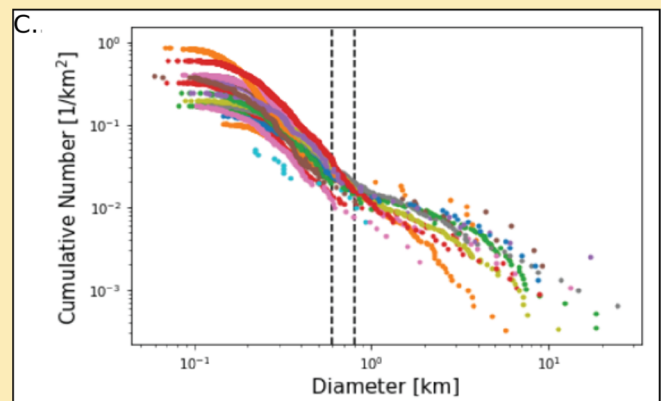
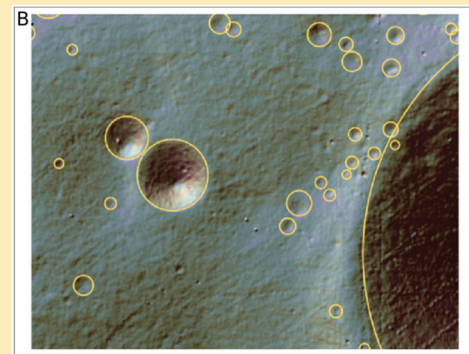
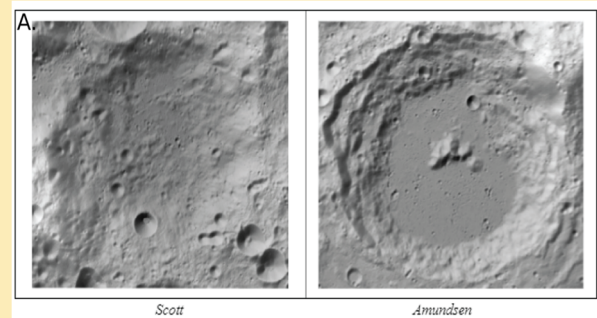
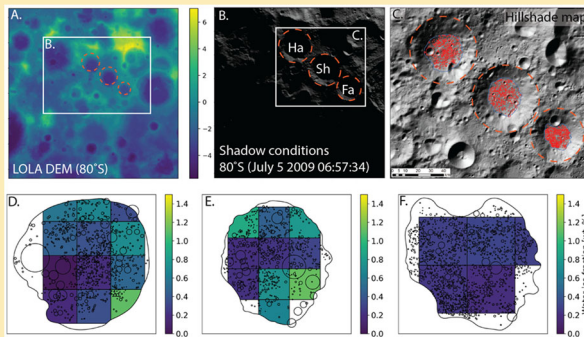


Lauren Talkington (M.S.): Degradation of complex crater walls on the Moon

By investigating complex crater walls, we are able to investigate different modes of degradation on the lunar surface. In this research, we investigate the effects of topographic diffusion on complex crater degradation. A comparison of degradation rates is shown in Fig. A. We use crater counting on the walls to investigate crater populations found in these regions (Fig. B). Of the crater populations observed, we see a distinct difference in populations >600 - 800 m in diameter (Fig. C).

Pedro Montalvo (Ph.D.): Surface processes in airless planetary bodies: Moon and Ceres

On the Moon, I am responsible for providing better constraints of water ice concentrations in permanently shaded regions (PSRs) (Figs. A.-B.) by analyzing the mixing of lunar regolith due to impact cratering events (Figs. C.-F.). Our target craters are Haworth, Shoemaker and Faustini, three lunar south polar complex craters that host water ice and are targets to future lunar exploration missions that will use such water ice deposits as a resource.



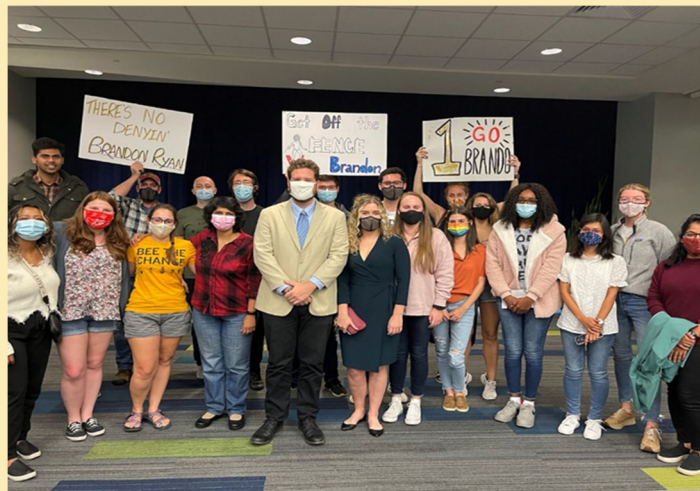
On Ceres, I am responsible for understanding crater degradation caused by processes such as ejecta blanketing and topographic diffusion. My tasks include extracting topographic information of the Cerean surface from crater counts that I collected. These are then used for further analysis, such as the thickness of the ejecta blanket (Fig. G; yellow outline) of Occator crater. Such analysis provides further constraints on crater degradation processes in Ceres.

Geosciences Welcome Back Event

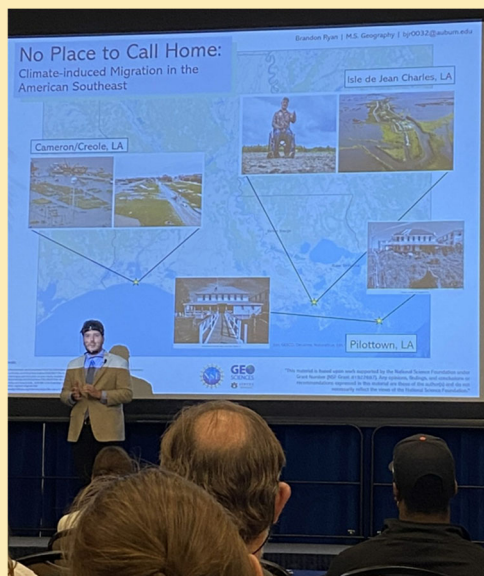


First Postdoctoral Symposium and 3MT Competition

We are proud of Dr. Natalia Malina for representing Geosciences at the first Postdoctoral Symposium at Auburn! Dr. Malina presented her work on interactions between dissolved organic matter and metals. Her work has important applications for metal bioavailability and toxicity.



Three Minute Thesis (3MT®) is a research communication competition developed by The University of Queensland. The exercise challenges current graduate students to present a compelling oration on their thesis or dissertation topic and its significance in just three minutes.



New Faces in the Department

Jake Nelson Assistant Professor

I joined Auburn in August, 2021 as a new Assistant Professor in the Department of Geosciences. I moved to Auburn from Austin, Texas where I completed a two-year post-doctoral appointment at the University of Texas. Before that I was in Phoenix, Arizona where I completed my PhD at Arizona State University. My main research interests surround the modeling and measurement of humans interaction with the built and natural environment. I am particularly interested in modeling human and environmental risk, resilience, and vulnerability to natural and anthropogenic hazards as well as the application of social theories to spatial science. I utilize GIS and geospatial technologies (drones) to conduct my research.

My wife and I have really enjoyed Auburn so far. Football season was crazy – everything we heard about SEC football is true and I'm looking forward to the upcoming baseball season. When I'm not teaching or doing research, I'm either golfing (although I'm not very good), enjoying an IPA, or walking our dog, Maisie.



Miss Maisie



Hiking around the Grand Canyon

Bonnie Bounds Lecturer

I joined the department in August as a lecturer in human geography. Before coming to Auburn, I spent two years as a visiting assistant professor in the Department of Geography at Texas A&M, and before that, I earned my PhD in geography from The Ohio State University. I'm originally from a small town in Georgia, so it's nice to be a lot closer to home! I mostly teach Global Geography, but have taught a variety of human geography courses over the years. This spring I'm teaching Geography of Alabama, so I'm very excited to learn more about my new home state! My research focuses on US rural economic development, particularly as it relates to gender disparities in higher education, and I also have a side project on the geography of the US beef industry.

My family owns a farm where we raise beef cattle and pine trees, and I've really enjoyed getting to spend more time there these days. I have a cat named Lucy, who took up with me while I was getting my master's at UC Santa Barbara and probably regrets her decision after having been dragged around the country with me. On the farm, my pet cow Kathleen keeps me company—she was raised as a bottle calf and loves hugs and attention from everyone she encounters. My favorite leisure activities include reading (especially nonfiction and literature in translation), competing with the cat to see who can nap the longest, and watching foreign films and TV shows.

Caption (pic with cow): Taking a selfie with a cow is a lot harder than you might think, but Kathleen graciously puts up with all my attempts.

Caption (cat): Lucy



New Faces in the Department

Murat Atasoy **Post Doctoral Fellow**

Dr. Atasoy's research interests focus on anthropogenic activity, urban growth, climate science and Remote Sensing applications with GIS. In particular, he offers courses in environmental science, GIS, urban ecology, environmental sociology, ecosystem services and management and climate change dynamics. In order to tie together the environmental disturbance and urban geography, he has worked extensively to enhance and extend the applications of Land Use/Land Cover change, urban growth dynamics, climate change and resiliency. He employs an integrated approach using GIS-Remote Sensing techniques, statistical analyses and urban growth models to disperse the knowledge in dynamics of human-environment interactions. Dr. Atasoy's present research projects are associated with the determination of Land Use/Land Cover change, urban heat island estimates and estimating human-environment interactions in relation to public health and sociology. His current project focuses on the urban growth and its correlations with health conditions of minorities in the US. Another aspect of his experimental study is to investigate different ethnic origin individuals' public green space accessibility using GIS-remote sensing techniques and statistical analyses. The prospective outcomes of his research will help global cities develop a necessary complement to facilitate better understanding of human-environment interactions, anthropogenic disturbance and landscape quality.

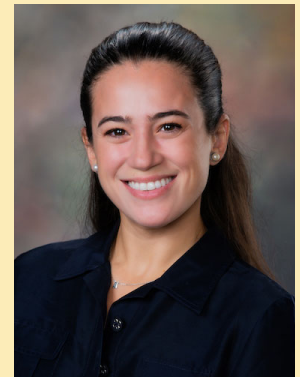


His future objectives include conducting research with interdisciplinary fields to examine urban heat islands, climate resiliency and sustainable urban growth model development. As a result, his research team will disseminate these findings through K-12 education and implicate STEM-based teaching techniques to utilize the empirical results with students and extension services.

Edna Fernandez-Figueroa **Post Doctoral Fellow**

I joined Stephanie Rogers' Geoldea Lab in the Fall of 2021 as a Postdoctoral Fellow after completing my Ph.D. in Fisheries, Aquaculture, and Aquatic Sciences at Auburn University. Although I am an aquatic ecologist by training, I frequently use geospatial tools such as satellites and drones to better understand the drivers and spatiotemporal distribution of harmful algal blooms in freshwater systems.

Dr. Rogers and I will be teaching a GIS Applications course with a focus on drone data collection, processing, and analysis (GEOG 5850/6850). Tell your friends!



New Graduate Students in the Geography

Subhasis Ghosh

Subhasis is a PhD student and a Graduate Research Assistant at the Department of Geosciences. He is an inquisitive researcher and a published author. He grew up in Bolpur-Santiniketan, a small town in eastern India which is set on a lateritic terrain near the Ajay-Kopai river interfluvies characterized by active gully erosional and badland topography. This fascinating landscape always intrigued him and drew him further to study Geography in his life.



He is a Physical Geographer, Geospatial Engineer, and an Urban Planner by training. He earned his Bachelor's (2016) and Master's degrees (2018) in Geography from Visva-Bharati University, India, and has specialized in the field of Terrain Evaluation (Applied Geomorphology).

In addition to his Master's degree, he has also pursued Post Graduate Diplomas in Geoinformatics (2019) and in Urban Planning and Development (2020) from India respectively. Similar to his academic background, he possesses an interdisciplinary research interest focused broadly on climate change, human-nature interactions, and sustainable development. Over time, he has worked extensively in multiple areas of land degradation and regional development, morpho-climatic interactions, urban sprawls, atmospheric droughts, and Landscape Ecology using advanced Remote Sensing, GIS, and Machine Learning techniques.

Prior joining Auburn University for his Ph.D., he was engaged as a Project Scientist at the West Bengal State Council of Science & Technology, India and worked closely with National Remote Sensing Center (NRSC) of Indian Space Research Organization (ISRO).

His present research aims to look into the global urbanization footprints and urban rainfall effect climatologies that is being funded through the National Aeronautics and Space Administration (NASA).

Subhasis is passionate about applying his skills and knowledge in understanding, addressing, and solving both environmental and socio-spatial issues aiming to ensure a better tomorrow. In his spare time, he enjoys playing volleyball, listening to music, hanging out with friends, and going out to relish the dazzling nature.

Sukanya Dasgupta

After completing her Bachelor's Degree at the University of Memphis, in her hometown, and Master's Degree at Auburn University in Civil and Environmental Engineering, Sukanya is continuing her education in getting her PhD in the Interdisciplinary Earth System Science Program in the Geosciences Department. She is currently a NRT Trainee under the advisory of Dr. Chandana Mitra. Her research focus is in urban agglomeration, climate modeling, urban heat islands, geospatial data, urbanization, remote sensing, and data science concepts such as data mining, machine learning, and coding in Python and R.



Syeda Nazifa Tasneem

I am Syeda Nazifa Tasneem from Dhaka, Bangladesh. I have completed my B.Sc. and M.Sc. in Geography and Environment from University of Dhaka, Bangladesh. My area of interest is urbanization, climate change, environmental pollution, GIS and Remote Sensing. Currently, I am pursuing my Master's in Geosciences Department (Geography concentration) at Auburn University.



New Graduate Students in Geography

Olivia Ainooson

Olivia Ainooson is a recent master's student in the department of Geosciences in Auburn University. She comes from Agona Swedru in the Central Region of Ghana. She is very optimistic about nature and has dreamed of becoming a geographer since her junior high school years. She has always wanted to be involved in solving environmental problems, understand the world and work tirelessly towards creating a sustainable future for the human race while addressing some sustainable development goals. Among them are Good Health and Well-being, Clean Water and Sanitation, Affordable and Clean Energy, Sustainable Cities and Communities, Climate Action and Life on Land. Her short term career goal is to work in a leading field that prioritize humans and their related geographical challenges within a specific space and time while creating a sustainable future. She also believes, the first step to ensure a sustainable development is by educating the general population and then taking ownership and responsibilities to mitigate the risks through the use comprehensive knowledge of many different geographical tools to study people available in a given space and time. Her favorite quote is " The greatest threat to our planet is the belief that someone else will save it" , Robert Swan.



Hang Song

Hang Song is currently a 1st-year Ph.D. student in Geoscience Department, Auburn University. He got 3 master's degrees in Nature Resource Management, MBA, and Industrial & Organizational Psychology. He can use R studio, ArcGIS, and Python. From 2016 to 2020, He worked in Psychology Lab and GIS Lab as a research assistant. He has working experience in data analysis, interview design, and TA training.



Brandon Ryan

Brandon Ryan is a second-year master's student in the Department of Geography. He is from Louisville, Kentucky and received his Bachelor of Science in Atmospheric Science from the University of Louisville, with minors in Environmental Analysis and Geospatial Technologies. Presently he is working under Dr. Chandana Mitra and the Urban Prism Group. His research currently focuses on climatic vulnerability and migration due to climatically induced weather events. He actively serves as the Sigma Gamma Epsilon Treasurer and Social Media Coordinator. He also participates in GSO, AAPG, the Marine Biology Club and the Auburn University Fencing Club.



Miranda Silano

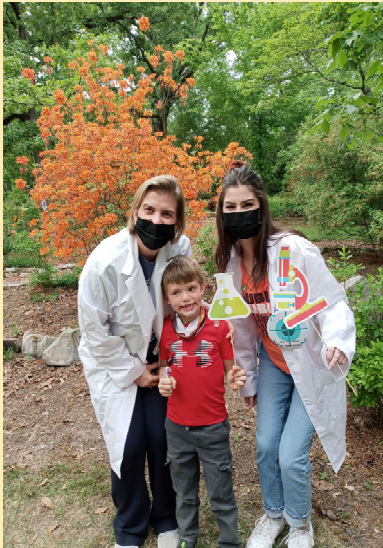
Miranda Silano has a Bachelor's of Science in Geology from the University of Florida. Her undergraduate research background is in vertebrate paleontology, paleoclimatology, and paleoecology. Her past research has involved using stable isotope geochemistry to help piece together past climates and ecosystems. Learning about the past has fueled an interest in the situation with current climate change, and how humans are involved. She is excited to start research with Dr. Chandana Mitra on climate change and urban sustainability and working with others to help make the Earth a healthier home.



Faculty News

McNeal Lab updates

I am in my sixth year here at Auburn University. I direct the Geoscience Education and Geo-cognition Research Lab which consists of one post-doctoral scholar, and seven graduate students (1 MS and 6 PhD). My group had six peer-reviewed papers and two book chapters published in 2021. One of these was published in *Earth's future* which highlighted a project where students used climate models and participated in a mock climate summit in classrooms around the country. Another article was published in the Journal *STEM Education Research* by my recently graduated PhD student, Dr. Nick Soltis, who is now working as an Assistant Professor in the Department of Physics and Earth-Space Science at the University of Indianapolis. The paper included the development and validation of a concept inventory for Earth System Science. A third publication by one of my current PhD students, Elijah Johnson, and was published in the Journal of Geoscience Education. The paper presented his Master's thesis work here at Auburn highlighted a spatial training activity Elijah developed using the Augmented Reality Sandbox. Dr. Lindsay Maudlin, a former post-doctoral scholar in my lab, also ob-



other AU faculty (Ojeda, Shepherd, Rodgers, Lee, Mulligan, Waters, & O'Donnell) join me in the project as Co-PIs.

tained an Assistant Professor position at Iowa State University in the Department of Geological and Atmospheric Sciences. Congratulations to both Lindsay and Nick in their new positions!

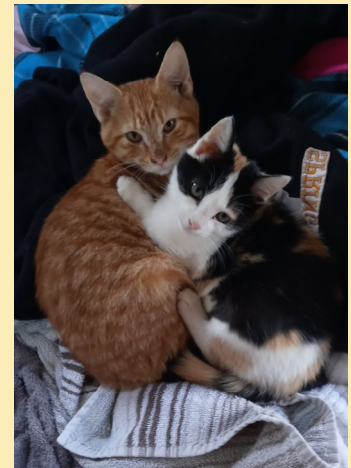
As far as grant efforts, we received a new project funded by the USGS Climate Adaptation Scientists of Tomorrow Program in Hydroclimate research where seven

The Project will house three REU students for two summers, make connections with partners from regional HBCUs doing work around climate change, and support graduate student research and professional development in climate science. We also launched another new collaborative project with Tuskegee University and the College of Engineering at Auburn. Our group will collect data about the impacts of new teaching approaches in sustainable engineering. We are also continuing to work on a series of three funded research projects with the Southeast Climate Adaption Science Center (SECASC), which focus on co-produced actionable science research in the region. The spring SECASC symposium will be in March on the Alabama coast. Finally, the NRT Project has accepted its second cohort of graduate students and we are

excited to have them aboard. The Cohort includes three new graduate students in the department of geosciences. The project hosted an Earth day event with COSAM's outreach office in April, 2021 where NRT Trainees 3-Minute videos were shown and they ran table activities for participants teaching them about recycling, re-using, and reducing their waste. The project will be hosting an on-campus Climate symposium on March 22nd, 2022 in the Student Center, so if you would like to attend please contact Katie Brown in geosciences. Other big news is that my family and I

moved out to the country to our farmhouse in Dadeville. We have hopes a building a new home on the property and making a homestead (with some animals starting with the two new kittens my kiddos already picked out and are caring for - Holly age 10 and Hunter age 7). My

husband is an avid hunter so he is enjoying the proximity to the deer too! The move was exhausting, so I am enjoying some down time (when I have it), the scenery of Alabama forestland, and close proximity to Lake Martin.



Continuing Faculty Members

Ann Ojeda

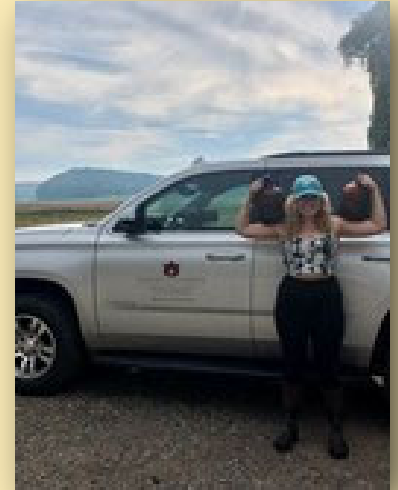
As 2021 ends and a new year approaches, its exciting to look back and see the growth of our team this year.

We've hosted three Undergraduate Research Fellows: Kerstin Glaser (GEOL), Emma Parmer (BIO), and Emma Henderson (GEOL). Kerstin and Emma P. wrapped up their projects in the spring where they investigated emerging contaminants like pharmaceuticals, herbicides, and pesticides in Parkerson Mill Creek. This fall, Emma H. began the fellowship program— her work is focused the microbial community in response to storm events in Parkerson Mill Creek.

Ella Larson, a M.S. student in the Ojeda lab, led a water sampling campaign to assess *E. coli* contamination within the Choccolocco Creek Watershed east of Birmingham, AL. With the help of Sidney Millner, an undergraduate field technician, the pair collected monthly surface water samples from nine sites from April to October. Ella and Sidney took *insitu* water quality measurements and brought back samples to the lab for emerging contaminant analysis. The overall goal is to use human signature proxies, i.e. caffeine and pharmaceuticals, to track human sources of *E. coli* within the watershed. Ella was also featured in the Winter Newsletter for the Auburn Water Recourses Center.



The technique quantifies the complexation capacity of dissolved organic and metals, which is important to understand the bioavailability and toxicity of metals in the environment. Caitlyn is working hard to calibrate the new technique to more traditional complexation methods like dialysis. This project has also sparked collaborations with other research groups that study metal-organic matter interactions here at Auburn in the Crop, Soil, and Environmental Sciences Department and at University of Texas-San Antonio.

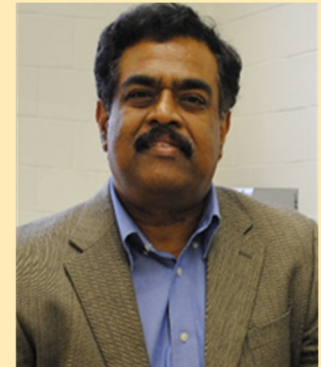


Ella Larson Posing with her water samples.

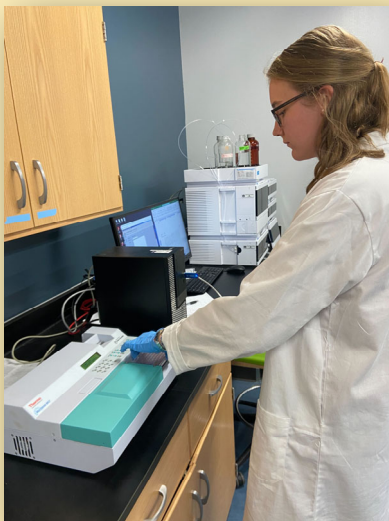
Ashraf Uddin

The year brought few accolades for the Uddin group.

Our PAIR project with Dr. David King was again funded by Auburn University to continue working on carbon sequestration.



Nora Lopez (MS' 2020) completed her thesis on carbon sequestration at the glauconite bearing Tuscaloosa sandstones. **Sharif Mustaque** made progress with his PhD project on eastern Gondwanan sedimentation and tectonics. A new graduate student (**Mahir Tajwar**) joined in January 2021. Another graduate student (**Riaz Uddin**) has joined my group in Fall 2021. Both Mahir and Riaz have been working on contaminant groundwater and sediments at the coastal Bangladesh. **Shifat Monami (MS' 2019)** returned to work on PhD on a Presidential Graduate Research Fellowship, which is the 1st for Geosciences. Had a summer intern (**James Marlow**) from Massachusetts on REU support. James worked with me and Lauren Beckingham of Civil Engineering on carbon sequestration. This was exciting to co-lead a virtual fieldtrip on the Carboniferous detritus from the Appalachians with Drs. Bill Hames and Jack Pashin at the Southeastern section of GSA hosted by Auburn University.



Emma Henderson performing the Biolog water sample assay procedure to assess PMC's microbial community.

Continuing Faculty Members



Bill Hames

Greetings and best wishes for 2022! The past year was very eventful for me and students working in mineralogy and petrology along with colleagues in the ANIMAL and EMPANADA labs. 2021 brought many improvements and shifts back to 'normal' in teaching, research and service. The Department of Geosciences was host to the Southeastern Section Meeting of the Geological Society of America in April, in an 'all-virtual' format. It was my pleasure to serve as the meeting Chair, and our faculty and staff shared responsibilities and efforts with a resolve that created an extraordinarily successful meeting (in

An attempted summit of Mt. St. Helens after GSA, cut short by an early storm.

staff shared responsibilities and efforts with a resolve that created an extraordinarily successful meeting (in



'EMPANADA' (home of the temeritous motto "without EMPA, you've got NADA") produced mineral compositional data for Marisa Barefoot, Çisil Badur, Sharif Mustafa, Sara Speetgens-Gilley, and



Çisil and a 'sunstone' at the Double Eagle Mine, Lake County, Oregon

Bishop Robbins, along with AU students in Materials Engineering and Biology, and visiting scientists from the University of Science and Technology in Rolla, MO, the University of Alabama, and the University of Georgia. AU Ph.D. student Dogancan Yasar made great strides in his studies of collisional orogenic terranes by beginning his work on samples from igneous and metamorphic rocks of the central Transantarctic Mountains, the southern Appalachians, and the Pontic mountains of Turkey – while also serving admirably as a GTA in petrology, mineralogy and physical geology. We look forward more learning opportunities and great research work with our students, colleagues and visiting scientists in 2022!



Dogancan in the underground Murphy Marble mine (L), and collecting from the 'Luck of the Yasar's Core' with Polycore Geoscientist Marshall Rich and Çisil, at Tate, Georgia.

financial support raised for the SE-GSA section, the quality of science presented, and participation). Teaching for mineralogy, petrology, and geochemistry classes gradually moved toward our typical 'In-person' formats through the year. Geochronology in 'ANIMAL' (the Auburn Noble Isotope Mass Analysis Lab) enabled Çisil Badur to determine the first reliable and accurate ages for the famous 'sunstones' hosted in basaltic lavas of Oregon (part of her MS thesis research on these gems) and the lab also provided age data to visiting scientists from the University of Georgia, Georgia State, University of Michigan, University of California Pomona, the University of Alabama, and support to mining company exploration. The Electron Micro-Probe Analysis lab,

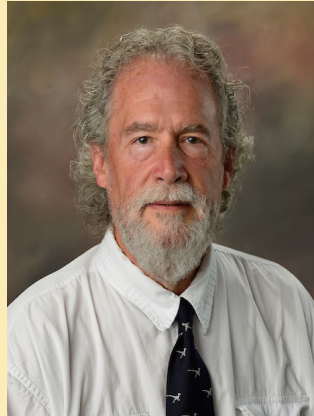


Near Mt. Hood after fieldwork in the High Plains of central Oregon on the way to GSA in Portland.

Continuing Faculty Members

David King Professor of Geology

During the past year, I continued research with funding from the following sources: ACS-PRF funding for a project with Haibo Zou on detrital zircons in Cretaceous strata of Arkansas, funding from NASA EPSCoR that involves me in a project with Toshi Hirabayashi (lead PI), and funding from the Electric Power Research Institute (EPRI; re. deep waste disposal sites in the southeastern U.S.).



Regarding the latter (EPRI), my work resulted in a chapter on deep waste disposal of nuclear materials in the EPRI publication on-line titled “Feasibility of borehole co-location with advanced reactors for on-site management of spent nuclear fuel.”

The web link for this monograph is

<https://www.epri.com/#/pages/product/3002019751/>

(see chapter 4 for my part on the southeastern U.S.)

My present graduate students are Pedro Montalvo (Ph.D. candidate working on impact craters on the Moon and Ceres), Lauren Talkington (M.S. student working on impact craters on the Moon), and Hephzibah Christopher (M.S. student working on impact craters on Ceres). Dr. Toshi Hirabayashi (Aerospace Engineering) is the co-supervisor for all three of these students and is presently guiding their research. My graduate students who finished this year (2021) are Leticia De Marchi (Ph.D. in Earth Systems Science who studied digital modeling of Wetumpka impact crater; co-supervised by Dr. Vinamra Agrawal in Aerospace Engineering) and Nora Lopez (M.S. in Geology who studied the Tuscaloosa Group in southern Alabama; co-supervised by Dr. Ashraf Uddin). Dr. De Marchi has joined our faculty as a Lecturer, and Ms. Lopez is pursuing a Ph.D. in ESS at Auburn.

Presently, I teach several courses on a regular basis in our department including Earth and Life through Time, Lunar and Planetary Geology, Stratigraphy, and parts of two graduate courses (Facies Analysis and Sequence Stratigraphy and Cycles in Earth History). I developed a new graduate class, Impact and Planetary Geology. Lately, I have been doing a lot of teaching via Zoom and Canvas, which is okay ... and works a lot better than I thought it would. Next year (2022), classes will return to the classroom and the field.

As I have been for many years, I am the advisor for the student groups, Sigma Gamma Epsilon and the Auburn chapter of the American Association of Petroleum Geologists. Also, I am the departmental coordinator for the Science Olympiad on campus each year. Recently, I returned to the Alabama Board of Licensure for Professional Geologists as the representative of academic departments of geology in our state.

This year, I was interviewed for two AL.com articles published in the *Birmingham News* and on-line regarding a series called “Ancient Alabama.” One article pertains to Alabama dinosaurs and the other, Wetumpka impact crater. The web links for these articles are below.

<https://www.al.com/news/2021/11/in-search-of-appalachiosaurus-t-rexs-alabama-cousin.html>

<https://www.al.com/news/2021/11/84-million-years-ago-a-massive-meteorite-strikes-ancient-alabama.html>

In addition to several papers and abstracts published this year, I am pleased to say that the fourth edition of my book, *Alabama Dinosaurs*, will be in print by the end of 2021. This time the book is being published by Sentia Press of Austin, Texas.

During fall semester 2021, I was on professional improvement leave (sabbatical). This was my first leave since fall 1999, and I sincerely enjoyed having time to focus on grants and papers for an extended period.

I would really enjoy hearing from former students. I have the same email address as I did when email first came to Auburn – kingdat @ auburn.edu. Would really like to know about your career and your recollections of Auburn geology back in the day.

Best wishes...

Continuing Faculty Members

Laura Bilenker

2021 was an eventful year for Laura Bilenker's Economic Geology & Geochemistry Research group with two MS student graduations (**Lucas Monroe**, **Marisa Barefoot**), one MS proposal (**Elyssa Rivera**), the arrival of a new MS student (**Jessica Patrick**), and a new Undergraduate Research Fellow (**Sam Warren**). Participation in two conferences (SE GSA hosted by Auburn and GSA Connects 2021) provided wonderful opportunities to engage with the broader Geosciences community and share our research in talks and posters.



Marisa and Dr. Bilenker finally had the chance to do their field work on iron deposits in Puerto Rico with colleagues of the University of Puerto Rico, Mayagüez (Dr. Tom Hudgins, David Giovannetti-Nazario). It was a wonderful and productive trip, long-awaited due to the pandemic. New graduate student, Jessica, and Undergraduate Research Fellow, Sam, have kicked off additional projects on Puerto Rican ore deposits as a result of this field work. Immediately after returning to Alabama, both Marisa and Dr. Bilenker started working with the department's Field Camp—it was a very busy summer! In the fall, second year MS student, Elyssa, was able to travel to the University of Georgia to perform sulfur isotope analysis as part of her thesis, which focuses on developing molybdenum and sulfur isotope geochemistry as a tool to understand ore deposit formation. Both Elyssa and Marisa gave great talks on their research at the **Geological Society of America annual meeting** in Portland.

Our graduating members also kick-started successful careers beyond Auburn. Back in May, Lucas began working for Hecla Mining in Nevada, and Marisa is about to begin a position in Montana working for Sibanye Stillwater.

The EG/G group and its graduates wish the AU Geo family the best and look forward to seeing what the next year brings!



Auburn and U. Puerto Rico team members David, Tom, Marisa, and Laura taking a break from field work at the Island Queen iron deposit in Puerto Rico, May 2021.



MS students David Giovannetti-Nazario (U. Puerto Rico) and Marisa Barefoot (AU) doing field work along the Portugués River in Puerto Rico in May 2021.



Continuing Faculty Members

Stephanie Rogers

This year has been an eventful one in the GeolIDEA (Geospatial Innovation, Development, and Environmental Applications) lab! We had added to the existing team of MS students **Mallory Jordan**, **Kaj Overturf**, and **Stephen Todd**, with Undergraduate Research Fellow **Bethany Foust** and Postdoctoral Fellow **Dr. Edna Fernandez-Figueroa**. The projects coming out of the lab remain varied in their scope. Kaj and Stephen have continued looking at the effects of environmental stressors on honey bee colony health; Mallory is investigating the contribution of onsite wastewater systems (i.e., septic systems) to overall water contamination in the Choccolocco Creek watershed in Alabama; Bethany has resurrected some of Dr. Rogers' PhD research projects surrounding Glacial Archaeology, this time in the Northwest Territories of Canada; and finally Edna's focus is on developing tools and methodologies for investigating harmful



algal blooms (HABs) in the southeastern US. Edna's work is partially funded by a grant from the Alabama Agricultural Experiment Station (AAES) which was awarded to our lab along with collaborators **Dr. Alan Wilson** (School of Fisheries) and **Dr. Yin Bao** (Biosystems Engineering). Collaborations are continuing with **Dr. Ann Ojeda** (Geosciences) on several water quality related to water quality perceptions, citizen science, and obtaining a better grasp on understanding how water contaminants move through systems at different spatial and temporal time scales. Research with Dr. Ojeda is funded through the Alabama Center of Excellence (ALCoE), the Alabama Department of Conservation and Natural Resources (ADCNR), and through a subaward from an NSF grant (PI **Dr. Eve Brantley**) supporting the use and development of big data and citizen science into an integrated approach for groundwater management.

On a personal note, I gave birth to a healthy baby girl on September 19th, 2021. Geoff, Arthur (our dog), and I were very happy to welcome Ruby Rhys Rogers Williams into the world!! The first months have been eventful and yes, we are getting some sleep. Ruby will start making appearances at Geoscience events in the near future!



Dr. Stephanie Rogers
Assistant Professor in Geography
GIScience & Geospatial Applications

@GeolIDEA_au



s.rogers@auburn.edu

The GeolIDEA Lab

Geospatial
Innovation,
Development, &
Environmental
Applications



News from Staff

Anthony G. (Tony) Hall

Laboratory Teaching Manager

Year 2021 was still a somewhat abnormal year, but we made strides to returned back to normal. Although we will probably never go back to way it was, we have continued to do business as close to normal as possible.

Social distancing remained in affect until Fall semester. So, in Fall we were able to put students back together in offices and classrooms back to normal capacities and the scheduling has become easier to deal with.

With the pandemic affecting every part of our lives, it affected my side hobbies as well. I got into woodworking but with the lumber prices skyrocketing, I had to slow down. However, in the summer I was able to shoot for the Atlanta Motor Speedway again and I resumed shooting football this season. I was still not able to travel abroad this year but with any luck, I will be able to travel somewhere next year.

I completed the Graduate Certificate in Geographic Information Systems Science in December and in the Fall semester, I began working in the Earth System Science PhD program.

I am hopeful that 2022 will bring new and exciting challenges and adventure. God Bless, stay safe, and War Eagle!!



Amy Goode

Accountant III

Congratulations to Amy for her promotion from Accountant II to Accountant III, effective 10/1. Amy has been performing in the capacity as the Department Accountant since 2019 and performing the duties very proficiently and professionally. Amy has been a real asset to Geosciences and COSAM, making us much more proficient at getting proposals submitted and funded. Our faculty and students are absolutely in good hands with Amy in the office to carry out the growing tasks of managing our budget and grants/contracts. Congratulations Amy, thank you for all you do!



Kiley Coan

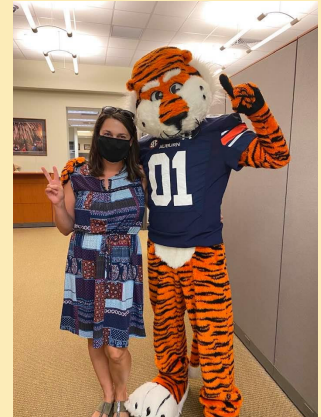
Administrative Associate

2021 has been a busy year, navigating back to in person classes, events, social gatherings, and travel. Our department has really worked together and made 2021 work.

My kids really enjoyed the Earth Day Awareness event. I was highly impressed at how the departments worked together to make this happen. It was very educational on a variety of topics and really captured the children's attention. My daughter especially loved the animal interactions and even got to interact with bees and snakes.

Back in the Haley Center, things have really picked up this semester. I enjoy helping the students register for classes, assisting with events, and watching them succeed and grow. Working in such a positive environment with such great people really makes my job fun!

I would love to mention, that I am a very proud mom of two girls who keep me very busy. I have a Thunder Soccer player in the 4th grade and an official teenager (8th grade) who loves baton, dance and makes the honor roll every year. They are life's greatest blessings. Cheers to a better 2022!



Ashleigh Rudd

Office Supervisor

Despite 2021 continuing to be a year of road bumps, our Department continued to work together to navigate through all the odds and abnormalities.

Outside of work, I stayed pretty busy throughout the year with sports. My son (Brantley) plays baseball, basketball & football, although he has a passion for football and hopes to play for AU someday. He played on a travel football team from May – October and that was truly an incredible experience to watch. As a parent, it's so rewarding to watch your child understand and recognize the value of hard work, discipline, and resilience. I'm looking forward to watching him improve and play out his passion for playing football.



Here's to hoping that 2022 is much brighter!

News from our Retirees

Dr. Mark Steltenpohl

Laura & I are both enjoying our retirement! We're blessed that our daughter Natalie (29) and granddaughter Adelynn (10 going on 13...) live here in town so that we're able to see them almost daily. Natalie's is a day care teacher for 2-year



olds. Adelynn has settled into in-person learning after being in virtual school since March, 2020. While Laura and I enjoyed our role as support teachers, Adelynn was happy for us to go back to being "just" grandparents this school year. Our son Greg lives in Louisville, KY with his partner Mallory. Greg's still working for the same geotechnical firm that's contracted through the City, and Mallory remains happily employed at the same veterinarian clinic. They bought a house last year and are rapidly filling it with cats; two, so far, who were abandoned at her clinic, needing surgical treatment. She repaired them and brought them home. Greg and Mallory enjoy University of Louisville basketball and we look forward to visiting them in January for the UNC game.

Laura & I are putting the final touches on *The Roadside Geology of Alabama* (Mountain Press). We've finished the first draft and just a few minutes before writing this we printed out the entire book to begin proofing it. Mountain Press asked us to hold off on submitting the book anytime soon because they have two other books in queue before ours; I know one is Wyoming because Janet Coker-Dewey, a former MS student of mine, is a coauthor on it. We're hoping to submit the first draft this coming spring.

I published several geologic reports last year thanks to my higher-order coauthors. One accepted paper will be in a GSA Memoir coming out next year. Another is an NPS Geological Resources Inventory Report on Horseshoe Bend Military Park. One manuscript on Scandinavian geology is submitted to the *International Journal of Earth Science*. I remain active as chair of the State Geologic Mapping Advisory Board, which gives me the opportunity to keep in touch with friends and colleagues. I'm also a volunteer worker for the Geologic Survey of Alabama. The folks there have been super generous with their time, providing expertise on a wide variety of topics that are included in the book.

Speaking of supportive colleagues, the Fall meeting of the AU Geosciences Advisory Board was well attended, our first face-to-face meeting since COVID hit. It was a real treat to be able to visit with such a wonderful group of folks who are working hard for the benefit of our department, students and faculty! Many thanks go out to Ming-kuo and the entire staff of the department for the wonderful retirement ceremony that they arranged in October for Lorraine, Ron, Chuck and me! We all were honored to be there and the evening was made even more special by all who were able to attend and those who sent us thoughtful cards and gifts.

The Steltenpohl family wishes each of you a wonderful holiday season! We look forward to seeing many of you in 2022.

Dr. Lorraine Wolf

I was delighted this year to join my colleagues, Mark Steltenpohl, Chuck Savrda, and Ron Lewis, in celebrating our retirements and witnessing the transition to new, energetic faculty rising in our wake (a water wake, that is, and not the other kind!) and we sail on to the next stage in our



journeys. Although I have officially retired, I have yet to fully pull up anchor, as I play an active role on student committees and on transitioning in a new director to the undergraduate research office. This year has seen the stern-side of several students as they have bowed to success and shoved off from graduate school for their new careers. I tip my captain's hat to Can Guven (2021-MS Geology), now employed at the General Directorate of Mineral Research and Exploration, Ankara, TURKEY, for his excellent work on the New Madrid seismic zone. Still in progress are Akilah Alwan (ESS PhD track) and Steffen Matthews (Geology MS track), both of whom are doing very interesting work. I am looking forward now to throwing a lifeline to a few papers that have been aimlessly drifting on the Sea of Incomplete Thoughts. Finally, I wish to sincerely express thanks to all my faculty colleagues, departmental support staff, and former and current students for making my years at Auburn both enjoyable and productive.

Departmental Awards by Phil Chaney

The Spring picnic was a big success. This event was held at the North Auburn Pavilion at Auburn University Fisheries. It was great to be able to gather again and to recognize all of the accomplishments of our students.

Thanks to gifts from our alums and other friends of the department, donations are used to support our students and our programs in many different ways. One way of recognizing students who distinguish themselves through their academics, research, service, and/or leadership is with scholarships or other types of awards, including plaques and cash.

Thanks to the hard work of our departmental Awards Committee (Co-Chairs Phil Chaney and David King, and committee members Chandana Mitra and Haibo Zou), we have established very well organized nomination, application and voting mechanisms to assure that deserving students are appropriately rewarded for their efforts.

Student Awards 2020-2021

COSAM Awards

Dean's Medalist (Outstanding Senior) for Geosciences-

Lauren Dickerson

Outstanding Junior in Geosciences-

Kerstin Glaser

Megha Shrestha– COSAM Travel Award and Outstanding International Student Award

Department of Geosciences Awards

The Endowed Dr. Charles E. "Chuck" Savrda Outstanding Graduate Student Award-

Marisa Barefoot

Outside of the University

Southeast Division of the American Association of Geographers, best poster Award

Stephen Todd

People's Choice Award

Ella Larson

Presidential Graduate Research Fellowship

ESS PhD Shifat Monami

Geosciences Advisory Board Awards

GAB Outstanding Student Awardees

Geology Undergrad Lauren Dickerson

Geography MS Haven Cashwell

ESS PhD Leticia De Marchi

GAB Outstanding Leadership-

ESS Eli Johnson

Geology Bishop Robbins

Geography Haven Cashwell

GAB Research Awards Summer Field Camp Scholars

Lidia Molina Serpas

Md Mahfujur Rahman

Sara Speetjens Gilley

Mahir Tajwar

I. Dogancan Yasar

Kerstin Glaser

Zain Webb

Daniel Leaphart

Josh Lombardo

Bishop Robinson

Andrew Gibson

Connor Ridenour

GAB Travel Grants

Fall 2020

Tyler Smith

Spring 2021

Leticia De Marchi

Nora V. Lopez Rivera

Steffen Matthews

Pedro E. Montalvo Jiménez

Lauren Talkington

Stephen Todd

Sukanya Dasgupta

Megha Shrestha

Annual Awards Spring Picnic



Dr. Chandana Mitra receives the Spirit of Sustainability Award



Chandana Mitra, Associate Professor in the Department of Geosciences in the Geography program received the Spirit of Sustainability Award..

Chandana teaches classes that are electives in the Minor in Sustainability Studies: Urban Geography and Sustainability being one, and Climatology being another. She's directed numerous studies with undergraduate and graduate students on climate change, sustainability, and urban climatology. And in the process, she fosters a strong research culture in students through teaching and mentorship. Currently, Chandana is working with a graduate student to create urban maps to help localities make informed decisions in creating more resilient, sustainable cities. Chandana is particularly passionate about climate change communication to the general population. She is a member of Climate Voices – Science Speakers Network, a new climate communications initiative.

She has organized multiple outreach events for school children focused on sustainability science topics. Chandana has frequently been featured in mass media as an expert on climate science and sustainability and is always generous with her time, explaining things in an easily understandable way. All her work as a physical geographer and climatologist is framed through the lens of sustainability.

Understanding the excessive heat generated in urban settings and the consequences for evaporation and precipitation is crucial if urban areas are to adapt and mitigate the impacts of a warming climate. And that's what Chandana does: She researches urban sustainability, impacts of urban growth and land use changes on local climate, and evaluates adaptation and mitigation techniques in warming cities.

Awards and Recognitions

Ashleigh Rudd

The Lilly-Lovelace Distinguished Service Award

The successes of the College of Sciences and Mathematics at Auburn University are often credited to its faculty and students. However, these successes are built upon foundations provided by the efforts of an outstanding and dedicated staff. The Lilly-Lovelace Distinguished Service Award is presented annually and recognizes individual staff members in COSAM who have helped to provide these foundations through exemplary service to the College.

The Lilly-Lovelace Distinguished Service Award is named in honor of two former COSAM staff members: Eva Lilly and Jan Lovelace. Lilly provided 42 years of service, most of which was in the Department of Geosciences. Lovelace was an executive support assistant in the COSAM Dean's Office for 13 years. The award was established in 2012 after Lovelace retired.

Ashleigh received a promotion from Office Administrator to official Office Supervisor. Ashleigh has been performing in the capacity as an office manager since January 2019 and performing the duties very proficiently and professionally.



Lauren Dickerson

Dean's Medal: Geosciences

Lauren Dickerson will graduate summa cum laude in May with a Bachelor of Arts degree in geography. During her time studying in the Department of Geosciences, Lauren has served as an undergraduate teaching assistant, research assistant, and administrative assistant, as well as the vice president of the Geography Student Organization during her senior year.



Lauren conducted research with Geosciences Associate Professor Philip Chaney, which included applying qualitative data to satellite imagery to locate and map canals around the world. Lauren's current research with Geosciences Associate Professor Stephanie Rogers involves finding and analyzing climatic data and preparing them for use to determine hotspots of Varroa mites, a parasite of bees. Lauren was awarded the Geosciences Advisory Board's Outstanding Geography Undergraduate Student Award for the 2019-2020 school year.

In her free time, Lauren enjoys riding her horse, completing jigsaw puzzles, consuming far too many podcasts, and playing Dungeons & Dragons with her friends.

Lauren is grateful to her department staff and professors for providing so many opportunities and encouraging her growth during her time at Auburn University.



Awards, Recognitions, and Retirement

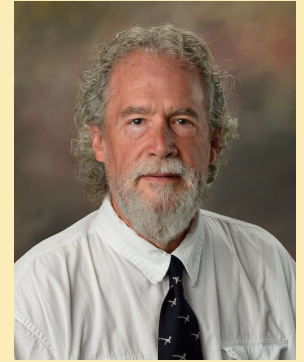
Stephanie Shepherd, Assistant Professor 2020-21 Faculty Fellow

The Biggio Center Fellows are recognized by their teaching excellence and leadership in innovative teaching and learning. In her role as a Faculty Fellow, Stephanie is developing workshops for faculty and graduate students on inclusive teaching to provide equal opportunities for our students to be successful in the classroom. Stephanie is recognized as a leader in promoting and implementing evidence-based teaching strategies within COSAM and has participated in or facilitated a variety of Biggio Center programs throughout her 7 years at Auburn. In addition, Stephanie is guiding efforts to build community and create a sense of belonging for students from historically excluded groups, as the chair of the Department of Geosciences GeoFIDE taskforce.



Dr. King appointed to the Alabama Board of Licensure for Professional Geologists.

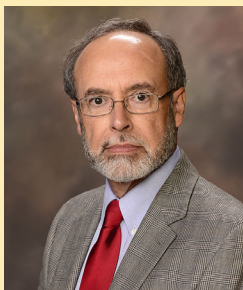
David T. King, Jr., Professor of Geology in the Dept. of Geosciences, has been appointed by Gov. Kay Ivey to the Alabama Board of Licensure for Professional Geologists



(ABLPG) for a term that expires in 2022. Dr. King took the oath of office for this position in October last year. He rejoins the ABLPG as the member who is the academic representative for the state's universities that offer B.S. degrees in geology. Auburn, like the University of Alabama and the University of South Alabama, offers a B.S. in geology degree programs that can lead to licensure for their graduates. Dr. King previously served as the academic member the ABLPG from 2005-2014 after being appointed by Gov. Riley. David King is a licensed professional geologist in the states of Alabama, Louisiana, and Texas. He is Auburn's designated program contact for geological licensure information for students.

Retirement Ceremony

Congratulations to our Retirees !! This year we recognized Dr. Mark Steltenpohl, Dr. Chuck Savrda, Dr. Ron Lewis, and Dr. Lorraine Wolf. Thank you for your service throughout the years, this Department wouldn't be the same without you. The Department of Geosciences wishes you all the best on your new adventures, and we look forward to hearing from your amazing stories on this new adventure!



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Vulcan Materials supports student scholarships



Left to right: Joe Howle - Environmental Manager, Vulcan Materials Company; Dr. Ming-kuo Lee; Keith Griggs - Notasulga Plant Manager, Vulcan Materials Co.; Ashley Underwood – College of Sciences and Mathematics, Development Associate; Jessica Crutchfield – Foundation Relations Officer, Auburn University Foundation; Atisthan Roach – Manager, Community and Government Relations, Vulcan Materials Foundation; and Joe Dykes – District Operations Manager, Vulcan Materials Co.

Vulcan Materials Company recently donated \$5,000 to the College of Sciences and Mathematics (COSAM) at Auburn University. For more than 20 years, Vulcan has generously donated for an annual academic scholarship for COSAM students in the Department of Geosciences. Several representatives from Vulcan met with Department of Geosciences Chair, Dr. Ming-kuo Lee and made a formal donation from the Company Foundation.

Vulcan is the nation's largest producer of construction materials including crushed stone, sand and gravel.

Back to travels by John Fronimos

Catedrais, Spain By John Fronimos



Guadalupe Mountains, Texas



Travels by Donn Rodekoeh

Nebraska Sandhills



Drie Rondells
Ehlanzeni, South Africa



Bighorn Mountains, Wyoming



COSAM's Graduation Marshal Daniel Leaphart makes grandfather proud by Maria Gebhardt

Daniel Leaphart is named after his grandfather who encouraged him to pursue a career in paleontology.

Leaphart, originally from Madison, AL, is the Summer 2021 Graduation Marshal for the College of Sciences and Mathematics (COSAM).

He is earning his bachelor's degree with a major in geology.

Since he was just two, he has been fascinated with becoming a paleontologist.

"When I first learned about dinosaurs, I wanted to learn more and more about the Earth's history," Leaphart explained.

As he graduated from Bob Jones High School in Madison and entered college, he decided to select a major in the Department in Geosciences.

"My time as a student at Auburn has been absolutely amazing," he said. "Being a student in geosciences makes for the most incredible work environment you could ever ask for."

Leaphart participated in the department's summer field camp.

"I was able to go to Dinosaur Ridge in Colorado and it was a dream come true," Leaphart explained.

Dinosaur Ridge was founded in 1989, and is one of the most famous and sought after fossil destinations in the world. Leaphart is pictured to the right in front of it. The dinosaur footprints are visible in the ridge behind him.

"Seeing the dinosaur fossils in the hill made me feel like I was a little kid again," he said. "I was so excited to see and touch these pieces of history that are more than 100 million years old."

Leaphart had multiple professors that made his learning experience outstanding over his four years.

"Dr. Ron Lewis was a terrific professor and mentor to me," Leaphart shared. "I learned about micropaleontology or fossils that need to be observed under a microscope, I helped him run fossil tests for the 2019 Science Olympiad, and I worked on a research project with him."

Since his retirement, Leaphart has been conducting research with another professor in the department.

"It has been really exciting to learn from and work with with Dr. Fronimos," Leaphart said. "He is a vertebrate paleontologist with a research focus on sauropod dinosaurs, which is exactly where I want to focus on."

Sauropod dinosaurs had long necks and were tremendously large eating leaves from the tops of trees from the early Jurassic to Late Cretaceous periods.

You can see Leaphart pictured with a cast of an Apatosaurus femur in the second photo to the right from a class with another professor.

"I also had an incredible experience with Dr. Wilhite," Leaphart said. "In his dinosaur biology class, I was able to look at fossil collections in Auburn University's Museum of Natural History."

Leaphart is passionate about his experience majoring in geology.

"Auburn's Department of Geosciences is small and that definitely elevates your student experience," he added. "You get to know all of the professors from your classes, you get to develop meaningful connections through those professors and you learn directly from them helping them conduct hands-on research in the field."

When asked if he would recommend incoming students to major in geosciences, he explained why the field is more vital than ever.

"Geosciences is an important area for students to study. When you think of all of the climate changes impacting society today and that will continue to reshape our future, geosciences can help us understand these complex issues," he said.

Leaphart is attending the University of Iowa this fall for graduate school.

"Through hands-on research with fossils at the University of Iowa, I will have an opportunity to learn about pre-historic crocodilians, which is really exciting, because many of them are very different from today's crocodiles."

Leaphart's grandfather passed away before his high school graduation, but his inspiration and encouragement has left a lasting impact on this Graduation Marshal.

"I hope I have made him proud," Leaphart said. "I wish he knew that I was preparing to enter graduate school on the way to becoming a paleontologist just like he told me I could."



Apatosaurus Femur



Daniel in front of Dinosaur Ridge in CO.

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For more information:
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Dr. Adam A. Payne
aap0047@auburn.edu

A MINOR IN GEOGRAPHY

Geography studies the connections among people, places, and environments. Our geography minor gives students a sound foundation in geography as a research-oriented and policy-related field of study. The minor also offers students the opportunity to acquire a variety of techniques and skills necessary to understand the spatial dimension of human changes in the physical earth, and to identify and analyze urban problems.

Geography as a discipline prepares students for a wide variety of employment opportunities in the public and private sectors, including careers in the fields of planning, transportation, real estate development, publishing, marketing, and resource management.

MINOR REQUIREMENTS

Required Courses (6 hour total):

GEOG 1010 Global Geography
GEOG 2010 Human Geography
GEOG 2020 Physical Geography

MINOR REQUIREMENTS CONT.

Elective Courses (9 hours total):

GEOG 3000 Sports Geography
GEOG 3110 United States and Canada
GEOG 3103 Alabama and the Southeast
GEOG 3130 Latin America
GEOG 3140 Africa
GEOG 3300 International Travel and Tourism
GEOG 3810 Cartography and Graphics
GEOG 5010 Urban Geography and Sustainability
GEOG 5210 Climatology
GEOG 5220 Geomorphology
GEOG 5350 Economic Geography
GEOG 5380 Political Geography
GEOG 5400 Geography of Natural Hazards
GEOG 5510 Human-Environment Interaction
GEOG 5550 Geography of Water Resources
GEOG 5820 Ariel Photography and Remote Sensing
GEOG 5830 Geographic Information Systems

Students must earn a "C" or better in all minor courses

Invest in the Geosciences at Auburn!

State funds and tuition pay only a small part of the costs to recruit and retain the best faculty and graduate students and support the undergraduate programs that are the hallmarks of the Auburn experience. Private funds sustain and enhance these extraordinary opportunities for students and faculty. The Department of Geosciences continues to provide the best possible education for our undergraduate and graduate students. Each year, private support provides the funding that helps support Auburn's margin of excellence. With our new Ph.D. program in Earth System Science, private giving is now more critical than ever. Please make your gift today via our secure website: <http://www.auburn.edu/cosam/departments/geosciences/Giving%20to%20the%20Department/index.htm>

We continue to welcome your gifts to any fund in the Department of Geosciences, and we hope you will consider any of the following funding priorities:

Geosciences Department: This unrestricted account provides the Chair with the most flexibility to apply support to the Department's most immediate needs, such as student and faculty travel, research, and equipment.

Geosciences Advisory Board: Our Advisory Board includes alumni, corporate, governmental, and community members who help support students, faculty, and staff in our department. The Board serves as a liaison with the geoscience business community and government entities to promote the interests of our department within Auburn University, the state, and beyond. The Board helps in our recruiting and retaining the most talented, motivated, and competent students and faculty by providing scholarships, grants-in-aids for research, CO-OPs, and internships.

Geology Alumni Endowed Scholarship: Provides scholarships for deserving undergraduate students majoring in geology.

Nick Hood Memorial Scholarship: The Nicholas L. Hood Endowed Memorial Scholarship was established by family, friends and classmates in memory of Nicholas L. Hood for the purpose of providing scholarships for students in the College of Sciences and Mathematics with a declared major in Geology.

For questions about creating scholarships and professorships, stock or estate gifts, specific programs, and suggestions on how you can support the Department of Geosciences, please contact COSAM development at the address below:

College of Sciences and Mathematics
Ashley Underwood

ashley.underwood@auburn.edu
(334) 844-2931

Editor: Kiley Coan rainskl@auburn.edu

Ashleigh Rudd, apr0022@auburn.edu

Department of Geosciences
Auburn University
2047 Beard Eaves Coliseum
Auburn, AL 36849-5305