THE UNIVERSITY OF TENNESSEE CHATTANOOGA

DEPARTMENT OF BIOLOGY, GEOLOGY AND ENVIRONMENTAL SCIENCE

BGE 2022 NEWSLETTER

FROM THE DEPARTMENT HEAD

Gretchen E. Potts, Ph.D. (Gretchen-Potts@utc.edu)

AS WE WRAP UP THE SPRING SEMESTER, I am in awe of how quickly time passes as we are already through the academic year. It has been a whirlwind of a semester, and it feels like I stepped into the role as the BGE interim department head just last week. While I am new to the BGE department, I have worked with many of you while serving as professor of chemistry or the director of integrated studies at UTC for the past 20 years. It has been my pleasure to work with you and serve the department. I had some big shoes to fill. Dr. Tucker led BGE for more than 12 years and returned to teaching full-time this fall and will be working on developing community partnerships. We are grateful for his strong leadership and dedication to the success of the programs. He oversaw the merger of Biology and Environmental Science with Geology, several program reviews, the renovations of Grote and Holt Hall, numerous equipment purchases, but most importantly, he was a friend and advocate for us all.

I am grateful to the 37 faculty and staff who are supporting our students every day. We currently have more than 700 undergraduate students distributed across all three disciplines and almost 30 students in the graduate program. Although COVID has limited some opportunities, our faculty have continued to engage in field work and research, resulting in numerous publications and presentations at conferences (virtual and in-person).

Finally, we want to recognize our alumni as your continued efforts to "pay it forward" inspire us. Thank you for supporting our programs through your donations to our gift funds. Currently, we are sending out hand-written thank you notes which include a department sticker. We would like to keep in touch with all of you, so please update your information using our online alumni information form. Also, we are very active on social media, so please consider following us on whatever platform you prefer.

SEMESTER HIGHLIGHTS

Undergraduate geology major Lauren Gossett was awarded Best Poster in the Sigma Gamma Epsilon Student Research Exhibition at the 2021 National Geology Society of America Conference.

One of our first graduates of the MS ESC program, Christine Boch Hunt, was recently honored with the Robert Sparks Walker Lifetime Achievement Award for Environmental Work, which is given by the TN Dept of Environment and Conservation. She was one of Dr. Craddock's first graduate students and founded UTC's Earth Day celebration in 1990.

Dr. David Aborn's work tracking migratory birds was featured by Tennessee's Wild Side. The short video features scientific efforts to understand the loss of bird populations.

Dr. DeAnna Beasley is featured in a podcast with SciStarter Episode 16: Climate Change and the Environment, where at the 37-minute mark she talk about citizen science and periodical cicadas (Urban Buzz).

Dr. Amy Brock-Hon, Dr. Shannon McCarragher (formerly in geography at UTC, now at Southern Illinois University Edwardsville), and three former students developed The ChattaStory Project which aims to engage and connect people with places by immersing them in the geography, geology and history of local sites using interactive ESRI ArcGIS StoryMaps. The StoryMaps can be viewed on a computer, phone, or tablet. Check it out at chattastoryproject.com.

Dr. Mark Schorr was named a member of the 2021-2022 All-Southern Conference Faculty and Staff Team for his contributions contributions in teaching, research, service and campus life at UTC.

RESEARCH HIGHLIGHTS

This year, we want to focus on and celebrate the research being conducted by our junior faculty members:

DR. FERNANDO ALDA, assistant professor in biology, has a broad interest in understanding how biological diversity is generated.

More specifically, Dr. Alda studies the evolution of freshwater fishes. There are more than 33,000 known species of fish–40% of which are freshwater fishes–yet freshwater fishes inhabit only 0.1% of the water available in the world. Dr. Alda uses a combination of samples collected in the field, natural history collections and molecular data to study the processes that have allowed freshwater fish to evolve such outstanding diversity.

At UTC, Dr. Alda is exploring new avenues of research to understand the role of genetic diversity in species invasion potential and as a tool for management and conservation. He has received funding to study alien invasive fish species in southern Appalachia. He compares the gut microbiome of alien fish species with those of native species to explore differences in their diversity and the rate of change when exposed to a new environment. Dr. Alda aims to test the heritability of the microbiome and identify potential signatures on the microbiome of alien species that could enhance their potential invasiveness. Dr. Alda expects that this new line of research will provide new opportunities to involve students interested in freshwater fish diversity and conservation in the Southeast.

DR. DEANNA BEASLEY, assistant professor of biology, researches ants, bees and 17-year cicadas to determine the challenges insects face in urban environments. Her findings have improved our understanding of how urbanization impacts insect biodiversity and morphology, generating the kinds of data we need for effective conservation and urbanization.

Dr. Beasley is passionate about using her broad knowledge of ecology and insect biology to educate others. Whether she is teaching a course on ant ecology or supervising student research projects, Dr. Beasley aims to help students become scientifically informed with a developed appreciation of the importance of insects to ecology and human health.

Dr. Beasley actively engages the general public in her research. She oversees a citizen science project involving input from Chattanooga area beekeepers on honeybee health and is part of a local multidisciplinary team of researchers exploring the interface between social and ecological processes in Collegedale, Tennessee.

Her contributions to the Chattanooga area community are critical to the University mission and make ecology accessible to a diverse audience. Through her work, Dr. Beasley is promoting a greater diversity of citizens engaged in ecology, and her students graduate ready to tackle important ecological issues.

DR. STEPHANIE DEVRIES, assistant professor of geology, teaches hydrology and aqueous geochemistry and conducts a variety of research based in field study, models of groundwater flow and physical experiments.

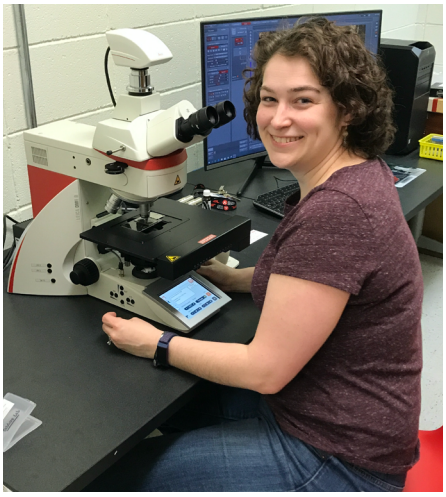
Dr. DeVries's research spans multiple regions throughout the U.S. For example, she conducts research in Wisconsin where she seeks to better understand the flow of water through glacial deposits that have remarkable hydrologic properties. This starts with detailed 3-D models of subsurface geology that are controlled by logs of sediments penetrated by wells, by geophysical surveys, and by surface geology. These models of the subsurface are frameworks for her models of groundwater flow. This research helps to identify sources of contamination and contributes to optimizing wells to avoid contaminants.

Locally, Dr. DeVries is working to identify sources of microplastics in our streams that contribute to the Tennessee River being one of the most plastic-polluted rivers in the world. Even at this early stage of her research, she is coming to realize that industry may not be as significant a source of plastics as commonly thought. UTC undergraduate students Lauren Gosset works with Dr. DeVries on this project and presented her research in an award-winning poster at the recent meeting of the Geological Society of America in Portland, Oregon.

DR. FRANCESCA LEASI, assistant professor of biology, has brought meiofauna research to Tennessee. As an evolutionary ecologist, her research integrates field investigations with morphological, genetic and high-throughput sequencing approaches to characterize biodiversity and disturbance of meiofauna. Meiofauna play fundamental ecological roles and can be used to assess the trophic relationship between smaller organisms and larger invertebrates or fish. Yet, their unexplored diversity represents one of the major challenges in environmental biology.

Dr. Leasi is currently exploring the surrounding freshwater environments in Tennessee where meiofauna research has been largely overlooked (until now). Despite heavy pollution, the Tennessee river is a hotspot for meiofauna and other biodiversity, so Dr. Leasi and her students have spent copious amounts of time researching these animals throughout Hamilton County and are preparing to disclose the first report of these small creatures inhabiting the Tennessee River.

Next, Dr. Leasi plans to evaluate how meiofauna communities respond to environmental and climate changes such as urbanization, thermal pollution, drought, flooding, surface runoff and habitat fragmentation–just a few of the conditions that regularly affect the Chattanooga area.



DR. ASHLEY MANNING-BERG, assistant professor of geology, applies her expertise to teach in the areas of sedimentary rocks, stratigraphy and paleontology, and to research the preservation of microfossils and geochemical aspects of the environments in which they lived.

The premise of Dr. Manning-Berg's research is that the geochemistry of chemical sedimentary rocks and their fossil content reflect the environments in which they formed. This approach, when applied to Mesoproterozoic rocks (those that are 1.6 to 1 billion years old), provides better understanding of geochemical conditions of early Earth ecosystems. A focus of her research is the fossilization of cyanobacteria in these rocks.

Dr. Manning-Berg's undergraduate students have grown bacteria of coccoid and filament forms, documented damage to these organisms caused by hostile bacteria and monitored stages of their decomposition. This research is important to helping scientists interpret the remnants of similar organisms that are preserved as fossils. Currently, Dr. Manning-Berg is currently directing an undergraduate student to grow and monitor what becomes of microbial mats that are more similar to modern and ancient fossil stromatolites.

From her research, Dr. Manning-Berg has gained considerable expertise in the area of climate and climate change, and is excited to be teaching a new class on the subject this spring.

TEACHING HIGHLIGHTS

Each year the Department of Biology, Geology, and Environmental Science presents the John R. Freeman Award to a faculty member who excels in teaching and working with BGE students. The award honors the late Dr. John R. Freeman's dedication to classroom teaching, his personal interest in student success, his humorous spirit and his love of BGE and UTC. Below, we highlight both the 2020 – 2021 and 2021–2022 award recipients. Congratulations to all for your hard work!

JEREMY BRAMBLETT SENIOR LECTURER 2020-2021 AWARD RECIPIENT

The Department of Biology, Geology and Environmnetal Science would like to extend belated congratulations to Professor Jeremy Bramblett who was selected as the recipient of the 2020-2021 John R. Freeman award. Professor Bramblett's excellence in teaching, commitment to student mentorship and his long-standing dedication to the department and University earned him this well-deserved recognition.

Professor Bramblett's contributions to the department have been vast. Students have commonly noted an appreciation for Professor Bramblett's passion for teaching and use of innovative approaches to support student learning. To support student success he has researched assessment methodologies and developed student learning objectives, program objectives and curriculum maps. He has also supported Dr. Hill Craddock's chestnut restoration project and worked with Dr. Tim Gaudin to expand the Natural History Museum mammal collection. Professor Bramblett has recently become involved in the establishment of a new Sustainable Mocs living and learning community hosted by BGE and which will be implemented in fall 2022.

CALLIE ADAMS ASSOCIATE LECTURER 2021-2022 AWARD RECIPIENT

The Department of Biology, Geology, and Environmental Science would like to congratulate Professor Callie Adams on being selected for the 2021-2022 John R. Freeman Award. Professor Adams's innovative pedagogy to engage her students and her commitment to fostering inclusion by applying an open mindset in the classroom to help all students learn regardless of background earned her this well-deserved recognition.

Professor Adams has earned high praise from her students, who describe her as an "engaging and energetic lecturer" who "makes you aware of what you do to impact the environment."

To support her commitment to embracing diversity and inclusion, Professor Adams recently implemented a series of active learning assignments in UTC's Introduction to Environmental Science course that exposes students to a variety of environmental justice issues. These assignments were developed as part of a College of Arts and Sciences collaborative project with the goal to weave environmental justice content into a general education course to better support UTC's mission of embracing diversity and inclusion as a path to excellence and social change.

STUDENT PROFILES

In every issue of our newsletter, the Department of Biology, Geology and Environmental Science likes to feature two especially outstanding students–one undergraduate student and one graduate student–to commend them on their excellent scholarship and hard work.

UNDERGRADUATE STUDENT PROFILE: MARTINA LEACH

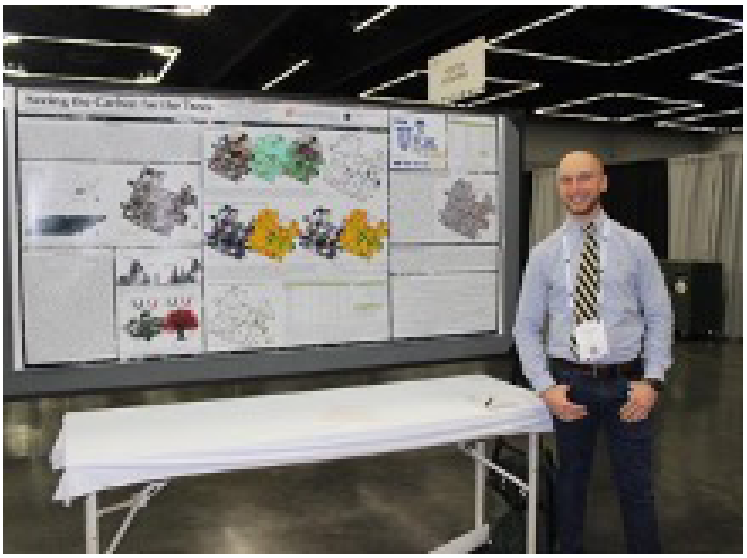
For her undergraduate study, Martina Leach researches microclimates along the University greenway as part of Dr. DeAnna Beasley's research on socio-ecological role of urban greenways.

Her favorite part of her study is being able to go out on the weather bike. "While collecting data, I also get to enjoy a nice bike ride," she says.

The biggest lesson Leach has learned so far is to ask questions and communicate. She says, "Having a mentor throughout my research journey has been the most helpful resource. Asking questions helps me clear confusion, refocus on a topic, and learn more information. Talking out ideas and collaborating has been effective. Communication is key."

After graduation, Leach plans to attend graduate school and be enrolled in a research program.

GRADUATE STUDENT PROFILE: WILLIAM STUART



William Stuart is a graduate student in the environmental science master's program who works closely with Dr. Azad Hossain in our geology program. Early this year, Stuart successfully proposed his thesis work, "Modeling the Carbon Sequestered in the Trees within the City of Chattanooga's Urban Forest Using Remote Sensing." Stuart's research is currently supported by the City of Chattanooga Forest Department and Lyndhurst Foundation.

Stuart is a BGE graduate teaching assistant and an interdisciplinary geospatial technology lab intern/GIS technician. Recently, he co-authored a chapter of the *Handbook of Climate Change Mitigation and Adaptation,* along with Dr. Azad Hossain and Dr. Amy Brock-Hon, titled, "Investigating Urban Heat Island (UHI) Impact for the City of Chattanooga, Tennessee Using GIS and Remote Sensing." He also presented a paper at GSA Annual Meeting 2021 at Portland, Oregon. Furthermore, Stuart is a member of the Beta Beta Beta Honors Society.

ALUMNI UPDATES

SABRINA NOVAK '98, '04 was recently promoted to the director of administrative services of the Hamilton County Health Department. She has been with the Hamilton County Health Department since January 2019. She currently directs accounting, emergency preparedness, facilities maintenance, information technology/data management, pharmacy, linguistics and medical records for the Health Department.

Please send any Alumni Updates you wish to see published here to **BGEINFO@UTC.EDU** for consideration.

IN ADDITION, we would like to ask our alumni for assistance. Last year, we asked for alumni volunteers to serve as mentors for our students last year. *We did not hear back from anyone.* Please consider doing this in the coming year. Many of our younger students, especially those who might be the first from their families to go to college, may not have anyone to talk with about the challenges of being a college student. There is good evidence supporting a correlation between the availability and interaction of alumni mentors and student success. Please contact us at **BGEINFO@UTC.EDU** to volunteer today. Our students need your help.

Lastly, we have set up an Alumni Advisory Board, and would like to ask for volunteers to help guide the BGE department in our many future endeavors. Please contact us at **BGEINFO@UTC.EDU** if you have questions about this board or would like to serve on this board.

FACULTY NEWS

DR. MARGARET "PEGGY" KOVACH, long-time faculty member, announced that she will retire from UTC at the end of this semester. Dr. Kovach has been actively involved in all aspects of the department since she arrived in 2002. Most noted for teaching courses in genetics, Dr. Kovach also managed an active research program throughout her time at UTC. Many of her former research students have gone on to graduate schools and medical schools. She will be missed by her students and colleagues alike!

CONNECT WITH US

Here in the Biology, Geology and Environmental Science department, we love staying connected with our alumni and students. You can now find us on various social media channels, including Facebook, Instagram, and Twitter. We love hearing from our followers and hope you will share news and questions with us.

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Greetings from the Biology, Geology, and Environmental Science Department at the University of Tennessee at Chattanooga. We hope you have enjoyed reading about the activities and accomplishments of the students and faculty members in our programs. Our department is a vibrant community of 33 faculty, four staff members, 850 undergraduates and 38 graduate students. Our faculty address fundamental questions in ecology, evolution, biological diversity, and geological structures in both their research labs and classrooms.

We remain dedicated to teaching, seeking new knowledge through research, and engaging the community through service. Our BGE students are doing great things. Some have earned prestigious fellowships, participated in field trips near home and abroad, and published significant research. Most classes and labs have resumed face-to-face instruction. We are excited to experience this period of growth and re-engagement with students and the community.

As a BGE alum, you know that we are a program committed to quality teaching, individual attention and experiential learning. Providing research experiences for students and outfitting our labs with updated technology is an important element of ensuring that our students are equipped with the skills they need for post-graduate success. As an example, our department has 12 teaching labs, each requiring 24 compound and 24 dissecting microscopes, or 24 polarizing ones. Aging equipment needs to be routinely replaced for us to provide students with experience on modern scopes.

Your gift today will help us replace old dissecting and compound microscopes in the Biology and Environmental science teaching labs, and polarizing microscopes in the Geology labs. We will also use donations to support research endeavors in the department and to bring in guest lecturers for our seminar series. *Every dollar makes a difference*. Your gift today will help the next generation of BGE students shape the future of science.

Thank you for believing in our mission and joining us as a champion of our students and for helping to provide quality education for generations to come.

Sincerely,

Gretchen E. Potts

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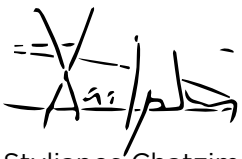

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