

The Department of Geological Sciences

2019 Newsletter



Community Outreach

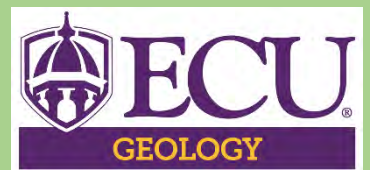
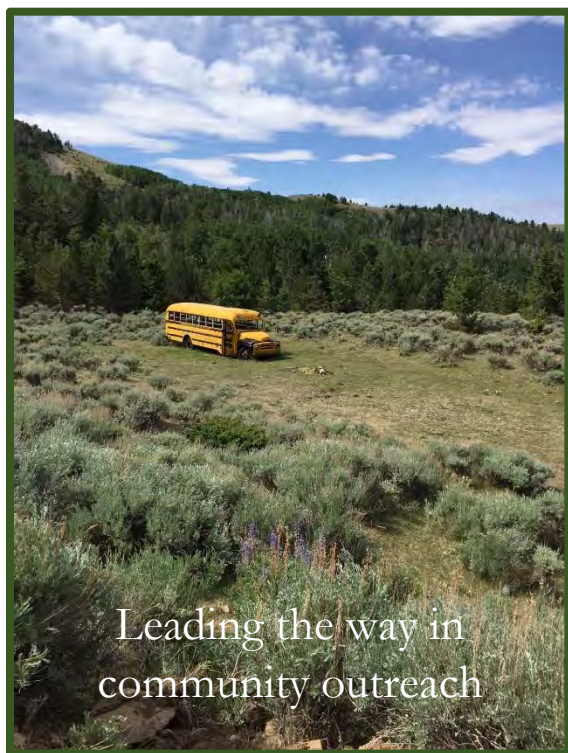


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We would like to give a special thanks to all those who contributed and made this newsletter possible.

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Thank you to Stan and Ann Riggs, and contributors to their endowment, for supporting this newsletter.

A Word from the Chair

CHANGE/OUTREACH/CHANGE/OUTREACH/CHANGE/OUTREACH

What a year! Those of us who have lived near the coast, or have hung around with Stan Riggs, know that, “There is nothing as constant as change”. Well, in the 12 months since the last Newsletter the Department of Geological Sciences embarked on an exciting new journey driven by myriad changes.

In January 2018 we said goodbye to J.P. Walsh who took on a challenging administrative job at the University of Rhode Island. A couple of months later Rick Miller and Richard Spruill announced their retirements, effective August 2018. And then Reide Corbett and Mike O’Driscoll transferred to the new Department of Coastal Studies in July. Late in the summer, Reide became the Dean of Integrated Coastal Programs and the Director of the Coastal Studies Institute. Marah Dahn, an immensely gifted person who took John Woods’ technical position in January 2018, was lured away by the international geotechnical company, Fugro, in November 2018.



We have not been standing idly by while these changes occurred. We began our adaptation to coming changes over a year ago when we took the lead, along with Geography, Planning and Environment, Chemistry and Engineering, and were awarded the opportunity to make an interdisciplinary cluster hire in the area of water resources. We hired Stephen Moysey from Clemson in August 2018. Stephen joined us as Professor and Director of the Water Resources Center, administratively located in Harriot College of Arts and Sciences. We were allocated the funds to refurbish much of the Graham Building, which will house the Water Resources Center beginning July 2019.

In January we hired Jim Eisenmann to replace Marah. Jim, a former Marine, has a strong background in physics and electronics in addition to boating experience. We have started the process of replacing long-term colleague, Steve Harper. We recruited at the annual GSA meeting in Indianapolis and will interview candidates in spring 2019. Finding someone as committed as Steve to both the department and field course will be a tough job. We will also be looking to recruit a second non-tenure-track person to teach introductory geology. And, of course, Terri Woods will be retiring at the end of the current academic year. We will be making a case for two or three new tenure-track faculty members. It will be difficult to replace talented teachers and excellent geologists like Terri and Richard Spruill but, of course, we will make sure that we select the candidates who will best suit our students’ needs.

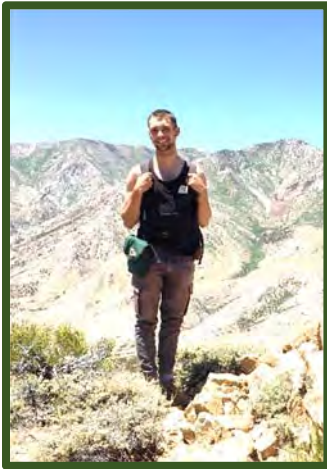
Amidst all this change, our students continue to do a great job. So, I end by thanking the team of undergraduate and graduate students who designed, contributed to, and produced this Newsletter. The theme this year is Outreach. Our students contribute greatly to the department’s efforts in this area. I’m happy to take this opportunity to thank them for all their hard work. I also acknowledge Stan and Ann Riggs (and all the alumni who helped match the Riggs’ donation) whose generous endowment makes this annual Newsletter possible.

I hope to see you at the cookout to be held this year at Jim Watson’s (details later in this Newsletter).

Steve Culver,

Chair of Geological Sciences
January 2019

Sigma Gamma Epsilon: SGE



Sigma Gamma Epsilon: Epsilon Phi Chapter – 2018-2019 year

The department of geological sciences at ECU is full of many great leaders in community outreach; students, faculty, and staff alike. In this year's newsletter we are excited to hear from many of these leaders on their experiences with community-science integration, outreach, and education. Our faculty and staff do a wonderful job of facilitating interactions between our students and the community with opportunities like Dr. Terri Woods' and Dr. Alex Manda's

Imagine NC program, planting trees as a part of Dr. Mike O'Driscoll's Town Creek Restoration Project, and working with Jim Watson on his research at the Meher Spiritual Center. Along with this, SGE provides a great opportunity for the students of our department to get more involved with their communities and make a positive impact with their Earth science education.

This year has been an exciting one for SGE in terms of outreach. This fall, SGE helped A Time for Science, a local science-outreach organization, put together mineral hardness kits for an educational event. We participated in a Wintergreen Elementary's STEAM night to encourage interest in science, technology, engineering, art, and mathematics. Volunteers from SGE put together a display showcasing our augmented reality sandbox and a display highlighting everyday products made from geologic resources found in North Carolina. Some of our volunteers also participated E.B. Aycock Middle School's annual science career day to help provide students with information on science careers and develop future career goals.



The rock sale this year was a huge success and is itself a form of community outreach. This event is always met with great enthusiasm from the ECU community, and we are able to spread our love of Earth science while raising funds to help pay for the annual cookout. Looking towards the future, SGE volunteers plan to help with the annual Science Olympiad competition this spring, and we hope to establish a written volunteer agreement with the Aurora Fossil Museum to aid in their ongoing outreach efforts. We hope to see many of you at the cookout later this spring to celebrate all our hard work!

-Tanner Eischen, SGE President 2018-2019

Young Pioneers: Student Outreach

Matt McDaniel: A passion for outreach!

I was fortunate enough to be able to volunteer with Dr. Terri Woods to present the Augmented Reality Sandbox across eastern NC while I was a graduate student at ECU. The most memorable of these events was the IMAGINE-NC summer program, led by Dr. Woods and Dr. Manda. This program serves to engage elementary and middle school students in lessons and activities related to the geological sciences. This experience was pivotal in evolving my hobby of community outreach into a passion.



The most meaningful experience of my time participating in outreach was at the Elementary School Science Olympiad. I was presenting the augmented reality sandbox to families attending the event. One child in particular, a four-year-old boy named Ian, was incredibly excited while interacting with the sandbox, returning to play with it multiple times throughout the day. His fascination was palpable, and he began experimenting with the sand. I was delighted to see the application of scientific principles by such a young child.

My experience volunteering at ECU allowed me to discover a passion for community outreach, specifically helping young children to become more familiar with scientific concepts. I was happy to represent ECU's Department of Geological Sciences in the community and share what I had learned with others. I believe that it is important for those involved in academia to go out of their way to interact with their community, because doing so dispels ignorance and helps others to better understand the world around them. This is most important with children, as outreach allows you to introduce them to concepts that they may have never otherwise known that they would enjoy. I feel that community outreach is vital, because it reinforces the notion that geological science is important to everyone, a thought which can sometimes become lost when science is only approached from an academic point of view.

(Matt McDaniel is currently living in Texas while finishing up his MS thesis.)

Daniel Gray: The importance of outreach



Public outreach is an essential piece of the scientific endeavor. Federal funding is a critical driving force for science, and that funding must have taxpayer support. Without a basic understanding of the scientific process, this public support is likely to decline. Recently, the scientific community has watched with growing concern an increasingly vocal public distrust of science and academia. Demystifying science through outreach is the first step in getting the public to appreciate the importance of science in their everyday lives. In today's world, direct engagement with those outside of science is critical not only to communicating what we've discovered, but also to promoting an atmosphere of

Young Pioneers: Student Outreach

trust between scientists and the public. Direct engagement can mean many things, but for me, public outreach is a powerful and immediate means of bridging the gap.

Scientists come at outreach from a slightly different perspectives. Some treat it as education, communication, or even policy. If you develop curricula or design professional development workshops for teachers, you're in science education. If you write press releases or tweet news from a big conference, you are in science communication. If you spend your days visiting legislators, you're working in science policy. For me, public outreach in science is somewhere in the middle of all three. Using the augmented reality sandbox I can teach and communicate to others some of the basics about their environment and how it affects them and how they affect it.

Getting out of your scientific comfort zone has benefits for your own outlook. As scientists, we spend a lot of time developing and refining expertise in a very specific, niche area and it is easy to forget where that expertise fits in the wider world. Doing outreach activities, especially ones that require you to explain what you are studying and why, makes you think about the bigger picture. What does your audience care about? Where does your work fit in?

(Daniel Gray is currently a MS student at ECU working with Dr. Heimann on analysis of beryls.)

Tyler Anderson: Imagine - NC

I have been given the amazing privilege of helping out with the IMAGINE-NC outreach project. I am a strong believer in community outreach and education about STEM concepts, and this program does just that! It has allowed me to educate middle school and elementary school-aged children about something I am truly fond of. There always seems to be this antipathy towards math and science concepts when it comes to educating others. This program really shows how this stigma is far from the truth. It has allowed me to teach a younger generation about how important and enjoyable these concepts are to learn about. Whether it is from teaching the children about landforms using an augmented reality sandbox or groundwater using three monitoring wells, these kids really are ready to assimilate every minute of it. This program has truly made me a better educator and person. It has allowed me to, possibly, change a child's mind about becoming a scientist and how enjoyable it can be. This camp, only being two years old, is genuinely making an impact in my life, as well as in many others.



Young Pioneers: Student Outreach

Lily Howie: My experience with outreach as an ECU undergraduate student.

When it comes to writing test questions for Science Olympiad, any information listed in the official rules book is fair game. The Fossils event, like most taxonomy events, relies mainly on asking students to identify specimens, expecting them to know the difference between trilobites such as the bug-eyed *Phacops* and the petite *Elrathia*. With so many invertebrates, it's always exciting for the students to work with the few dinosaurs and megafauna on the list, so one year I made use of a plastic model of *Stegosaurus*. As the students moved through the stations during the event, it was obvious that they were sneaking glances over to the model, excited to rotate around to the dinosaur station. Eventually they would get there, turn over the question paper as instructed, and be met with: "*This dinosaur, Stegosaurus, is the state fossil of which U.S. state?*"

Reactions were mixed. Some guessed, others saw the question and immediately turned to a marked page in their rules-compliant notebooks. But while such questions about minute details are used to separate the top few teams at the state level, it's not that kind of knowledge that impresses me. No matter how many times I've done it, *every* team that participates leaves me breathless. Even the lowest-scoring teams at these competitions can correctly answer questions on in-depth geology material. These are middle and high school students who are familiar with the extent of continental ice sheets during the last glacial maximum, the effect of Milankovitch cycles on global climate, and the process of reconstructing geologic events from a sedimentary sequence. I think that's pretty incredible.

The programs I had the opportunity to participate in sought a wide range of participants, from Girl Scout STEM day at ECU, to the Pitt County elementary school Science Olympiad, to the IMAGINE-NC summer camp program that brought Beaufort County students behind the scenes of the Aurora Fossil museum. These opportunities to get out of a classroom and into a lab or the field with active research scientists were invaluable to the students. Many at the IMAGINE-NC camp had never been on a boat before, and a few didn't even realize how close they lived to North Carolina's barrier islands and extensive estuarine system. The students got experience testing groundwater at monitoring wells, collected and tested water samples from the Pamlico River, got their hands muddy analyzing sediment cores, and even got a guided tour of the PCS phosphate mine. They listened to personal stories from ECU professors such as Dr. Alex Manda and Dr. Terri Woods about their interests and career paths, and played so enthusiastically with the augmented reality sandboxes that it was hard to pull them away. The experiences sparked a childlike curiosity in them: that curiosity upon which all science is founded.

We know that not all of these students will become geologists; in fact, most of them will not. But that doesn't make it any less important to teach them about the world around us. No matter the profession that a child goes into, every one of them is going to grow into a citizen of eastern North Carolina, of the United States, and of the world. With a growing need for land and resources, the ability to make informed decisions based on scientific evidence will serve both them and their communities. All these experiences- Science Olympiad, IMAGINE-NC, and others- are not possible without the professors and student volunteers from ECU. These are experiences that impart both the participants and volunteers with knowledge and resources that are invaluable.

Far more valuable, certainly, than just knowing that *Stegosaurus* is the state dinosaur of Colorado.

(Lily is currently in her first year of the Master's Program at Coastal Carolina University.)



Lily and her brother working at the North Carolina state-level Science Olympiad tournament in 2016

Young Pioneers: Student Outreach

Shannon Briles: Reaching Out Further

Communicating and sharing findings is a big part of the scientific process. Many believe that this concept is only referring to others in the science community, however there are many benefits to reaching out even further. Coming from a very small town in northern North Carolina I never even thought of being a geology major. I did not even know such a major existed. I did, however, love “earth science” and thought I would love to teach people about it one day. Thus, I came into college with the intention of being a high school teacher for the rest of my life and along the way completely fell in love with geology. I brought much of this love and joy into my internship high school classroom, teaching about rocks, minerals, and hydrological processes. It amazed me how responsive high school students were to these concepts, however I noticed that many were not certain about the significance of them in everyday life. I knew that these students were left wanting to know more and I think that as geologists from ECU we can do more to satisfy that craving to learn.



Shannon standing on the Blueridge mountain parkway.

I have seen first-hand the excitement that young students have when they get to play with the augmented reality sandbox. I think that we should challenge ourselves to bring this same excitement to many other aspects of our field, as well as reach out to more of our community. There are many schools with students of all ages in Pitt County and we should strive to bring our love for geology to many more of them. Our community is growing, and it is our job to make sure that the knowledge and fun of geology grows with it.

(Shannon Briles is currently a senior at ECU.)

Nicholas Ali-Martinez: Science Olympiad is a great example of fun outreach

Volunteering in the community has been an important aspect of my life since I was a young boy. A community that is united and works as a functioning system thrives together. That’s why I chose to major in ECU’s Geology program. The department participates in many community volunteering programs that deal with local schools. Every year ECU co-hosts the Greenville (K-12) regional Science Olympiad event, where local children can learn and test their scientific knowledge. Undergraduate and graduate level geology majors can be seen advising, observing, and judging Science Olympiad events and exercises. Not only are we promoting scientific learning, the children are learning how team building and problem-solving skills can be beneficial for their futures. Volunteering at these events, I’ve seen how fun, hands-on learning can be beneficial for all ages. This is just one of several examples of how the Department of Geological Sciences stays involved and influential in the community.



(Nicholas Ali-Martinez is currently a Senior in the geology program at ECU.)

Leading the Way: Faculty and Staff Outreach

Alex K Manda: The sandbox wins again!



Over the last two summers, I have had the great pleasure of collaborating with Dr. Terri Woods, and Cindy Crane from the Aurora Fossil Museum in hosting a week-long, non-residential summer camp for middle and elementary school students in Aurora, Beaufort County called Imagine NC. The summer camp has been a great success at not only providing the K-12 students with fun hands-on-activities, but also providing opportunities for geology faculty and graduate students at East Carolina University to interest K-12 students in geology careers, improve students' competence in geology, and nurture students' enthusiasm for geology.

Each time we have held the summer camp, I have looked forward to seeing the excitement and anxiety on the faces of the little campers on the first day of camp. The anxiety, however, usually quickly diminishes when the campers are introduced to the augmented reality sandbox. The sandbox, which is used to communicate concepts about landforms and topography is usually transported from East Carolina University and assembled by graduate students and other volunteers at the camp. On the first day of camp, it is easy to see that the hard work put in by the volunteers to get the sandbox ready pays off quickly



because the sandbox is usually a major hit with the campers, so much so that they continue to play with the sandbox every opportunity they get for the rest of the week.

On day two, the students are exposed to different rock and mineral samples before being taken out on a cruise on South Creek (a tributary of the Tar River) to collect water samples and measure water quality parameters. The students are usually excited about going out on a boat because most of the campers have never been on one before. In one year, when we took the students on the cruise, we saw porpoises and jellyfish in the river, and a drag line working at the phosphate mine. In another year, the students got a chance to drive a boat, and yet, when we asked the students what their favorite activity was, the answer was the sandbox!

Leading the Way: Faculty and Staff Outreach

On day three, we break out the Geoprobe drilling machine, drill a hole in the ground, and extract some core. Then, we bring out several physical groundwater models to illustrate groundwater flow concepts. But when the day ends, the campers select the sandbox as their favorite activity.



On day four, we take the campers out to a groundwater well-field where the students measure water quantity and water quality parameters in the monitoring wells. We also run some water quality demonstrations in the lab. But at the end of the day, the sandbox is king!

On day five, we take the campers on a bus tour of the mine (some of the campers have never been to the phosphate mine in Aurora even though their parents work there, or they live close to the mine) where we have a discussion about careers in science. We then have a pizza or BBQ lunch, but at the end of the day, what do the students say was their most favorite activity? You guessed it, the sandbox!

This summer, the final year of the Imagine NC summer camp, we will need several volunteers to assist with running summer camp activities that will help with recruiting young scientists to the geosciences.

We will need volunteers to communicate science while assisting with the boat cruise, the Geoprobe, physical groundwater models, rocks and minerals, the groundwater well field, and of course, the sandbox. If you are interested in volunteering and communicating science to young kids, please contact the author at Mandaa@ecu.edu, we would be glad to have you on board!



Leading the Way: Faculty and Staff Outreach



Cynthia D. Crane

Executive Director

Aurora Fossil Museum Foundation, Inc.

M.S. Geology 2011

Greetings fellow ECU Geoscientists! My name is Cynthia (Cindy) Crane, I'm a 2011 alum of the Department of Geological Sciences and am the Executive Director of the Aurora Fossil Museum Foundation, Inc. With the museum's mission to educate, a large component of my duties is to organize, oversee, and facilitate the museum's outreach efforts. As a scientist, I feel that there is a great need to introduce and engage people of all ages with science. Thus, it has been second-nature to expand and enhance the museum's outreach.

Outreach for me comes in many forms, sometimes it's through attending local, regional, and statewide



events, other times it's being a guest lecturer for Teen Science Café's and Noon Rotaries or hosting events and festivals at the Aurora Fossil Museum. Sometimes it's going to classrooms or summer camps and sharing about the rich fossil record of Eastern North Carolina. On average, my outreach efforts impact and educate over 100,000 people a year. Although, I'm involved in many aspects of outreach, I find witnessing the reaction on a child's face the first time they lay eyes on a large *C. megalodon* shark tooth or having a child enthusiastically tell me that they are going to be a paleontologist just like me when they grow up are the most rewarding moments to me. I have such a great job and I am very fortunate to be an East Carolina Pirate!



Leading the Way: Faculty and Staff Outreach

Can Playing Games and Telling Stories Change the World?

Stephen Moysey
Professor, Geological Sciences
Director, ECU Water Resources Center

Several years ago I had a project working with villagers in India to assess the sustainability of their water resources. One day the organization that I was collaborating with on the project, the Foundation for Ecological Security (FES), introduced me to the game Naranpur Express, which they used to train their field staff to think about economic issues that villagers face in their communities. My colleagues from FES handed me a little cutout piece of grass that was my farm, some paper people (my family), and a cartoon cow. We then began to produce grain, milk, and other goods, which we could trade with each other as we worked to find a way to survive together. FES used this game to change the way that their staff interacted with villagers in the creation and implementation of community-level development programs. It was a great introduction for how games or, perhaps more accurately, simulations can be used to engage us and help us think about the world we live in, particularly for aiding in making decisions about how we perceive and interact with the real world.



Though my background has always been in science, I immediately saw Naranpur Express as a great way to teach students about water resource issues. I therefore started my journey into game-based learning for earth science as I adapted FES's game to have a water resources component and implemented it using Excel spreadsheets, later turning it into a multiplayer web version (Naranpur Express Online). What I learned is that games are a powerful way to explore a wide variety of issues in our society and the complex interactions between them. I wanted students in my class to learn how mass balance in a watershed means that they would need to work together in managing a scarce resource, but they also explored how they as a community could develop a wide range of social practices and norms to impact behavior – I certainly never thought that I would be having conversations ranging from communism to infanticide in a water resources class!

My experience with the Naranpur Express game left me wondering how else we could engage students and the public in the earth sciences. As domain experts, we know that studying the Earth is critical to developing the resources needed by society, minimizing risks from natural hazards, understanding how our world will change in the future, and informing the policy and economic decisions that shape our everyday life. Unfortunately, many students and the general public don't share the deep understanding of these issues that we develop as geoscientists. Thus, games and other hands-on learning activities provide a pathway for engagement, communication, and education on topics that people may think are "boring". Since Naranpur, I have been exploring a wide range of approaches for

Leading the Way: Faculty and Staff Outreach

engaging people in geoscience. For example, today we can use the smartphone in everyone's pocket as a key to unlock exploration of the field through geocaching and citizen science or we can bring the field back to the public using virtual reality. The potential is unlimited, but what would motivate a non-geoscientist to do these activities? If we truly want to increase interest and help people understand why earth science is so important to our society, we must take one extra step: we must become storytellers. We must link our data and observations, which are so important for science, to the personal experiences that drive human behavior. We must see and speak for the Earth as geoscientists, but using a language that those outside our profession can understand.

I challenge our geology students to become a generation of storytellers for the Earth. We are working to build opportunities at ECU that will aid students in becoming leaders through their science and stories. The Water Resources Center and Department of Geological Sciences are supporting student-driven science to understand water quality impacts from hurricanes, which will ultimately help communities in their planning and decision making. We are working to increase access to campus resources and technologies, such as building a virtual reality lab for the geosciences. This spring students will have the opportunity to join us on a study abroad to the Caribbean to investigate and document island sustainability. There are numerous opportunities to become engaged as a student and to share our love of earth science, but ultimately the success of these and other efforts will depend on how willing our students are to be engaged and make a difference.

The next time that you are heading out to the field to collect data or are watching the latest natural disaster unfold in the news, please consider the story you have to tell. ECU has the tools to help you to tell these stories: film a video, make a website, build a citizen science app, produce a virtual reality experience, create a new game. These are all easier than they sound and I welcome any student who is committed to becoming a storyteller to join me. Maybe you will have some fun or, just maybe, you will tell a story that will help to change the world!



Leading the Way: Faculty and Staff Outreach

Jim Watson: Hydrology Research

In early 2013, the Meher Spiritual Center management had contacted me regarding a 40-acre lake located within a few hundred meters of the beach on their 500 acre forested property in the Myrtle Beach area. The lake had been clear, with many apparent springs, ever since the Center's founding in the 1940's. Now it appeared to be filling in. Knowing that Hurricane Hugo had inundated the lake in 1989, I headed down there with some vibrocore pipe and the hand pounder, thinking that if I could intersect the Hugo overwash deposit, I would be able to establish a sedimentation rate. This exercise was successful, but the question remained: why had the character of the lake changed in the early 2000s from an oligotrophic to a eutrophic character, with an extensive, low-oxygen zone of decaying organic matter. A consulting team from UNC suggested that the problem might be excessive nutrient influx. Since there is little surface water inflow, groundwater nutrient flux was suggested as the possible cause, given the presence of some cabins and dwellings on the Center, plus a nearby town, all served by septic systems. Mike O'Driscoll agreed to work with me to submit a contract proposal. So, with the able help of grad student Adam Trevisan we proceeded to investigate the situation by installing monitoring wells on land and in the lake. As luck would have it, ECU Geology Alumnus Will Doar,



Jim Watson in the Meher Spiritual Center lake with core containing a Hurricane Hugo depositional unit.



Will Doar, B.S. 1993, M.S. 1998, with his stratigraphic coring system

now the senior coastal plain geologist with the SC Geological Survey, was in the process of mapping that very quadrangle. He agreed to do some of his stratigraphic coring on the Center property, which added greatly to our understanding of the subsurface.

After submitting our initial report, we moved on to the second phase of the investigation, now with the help of graduate student Paul Mays. This phase has involved more detailed studies of subsurface nutrient fate and transport, including modelling of the surficial aquifer, and some detailed porewater studies. As work proceeded, we began to suspect that the disappearance of the springs that had formerly dotted the lake bottom might be an important factor in the change in the character of the lake, and that nearby mining activity could be related. Work continues along multiple lines of enquiry, and we plan to submit a final report during the coming months that will help the Center to develop a sound plan for management of lake-related issues.

New Beginnings



Integrated Coastal Programs: Dr. Reide Corbett

Reide Corbett spent 18 happy and productive years as a faculty member in Geological Sciences. In summer 2018 he transferred to a new department that he describes below. He is currently Director of the Coastal Studies Institute and Dean of Integrated Coastal Programs. His article describes these organizations and their raison d'être. Given the long and continuing interests of our department in coastal geology, we look forward to the many opportunities to collaborate with Reide and his colleagues in the future. Steve Culver, Chair, Geological Sciences

The world's population currently stands at more than 7 billion people, roughly half of them living within 100 kilometers of a coastline. Coastal population growth in conjunction with climate change puts increasing pressure on coastal ecosystems. Natural (e.g., Hurricane Florence and its aftermath, etc.) and anthropogenic coastal change (e.g., Deepwater Horizon oil spill; coastal overdevelopment and hardening; diminished coastal water supply and wastewater issues; coastal gentrification) create numerous challenges to residents in the coastal zone. To ensure that humans can adapt to changes and take advantage of opportunities in these economically important ecosystems, we must develop a comprehensive understanding of the processes, cycles, and interactions across this vitally important land/ocean interface.

ECU is fortunate to have a strong combination of natural, social, engineering, and health science expertise, coupled with interdisciplinary graduate programs that are leading to important contributions in coastal sustainability and humanity's relationship with the environment. To better integrate across disciplinary boundaries and collectively focus new efforts along the coast, ECU's coastal research and education activities were recently consolidated into single cohesive unit, the Integrated Coastal Programs.

Integrated Coastal Programs (ICP) includes faculty and staff from across ECU's main campus and from the Outer Banks Campus, located in Wanchese, NC on Roanoke Island ICP administers the Coastal Studies Institute and the new interdisciplinary Department of Coastal Studies, which also houses the interdisciplinary coastal science PhD. The Coastal Studies Institute (<https://www.coastalstudiesinstitute.org/>) is a multi-institutional research and education partnership of the UNC system and focuses on integrated coastal research and education programming centered on responding to the needs, issues, and topics of concern of the residents of eastern North Carolina. CSI research integrates the natural and social sciences and brings together researchers from different disciplines to answer pressing coastal questions.

The Department of Coastal Studies (DCS) is a new coded unit within ECU and will help coordinate and enhance research communities across ECU's Greenville campuses, the Outer Banks campus, and our partner Institutions, and provide ECU with a strong center and point of contact to expand its leadership role in

New Beginnings

addressing interdisciplinary coastal and marine issues. The founding DCS faculty were recruited from existing ECU departments, including Geological Sciences, Anthropology, and Economics. During this inaugural year, DCS is searching for four additional scholars through a faculty search that will form an important part of the core of this new research-focused department.



Dr. Jay Golden, Vice Chancellor Division of Research, Economic Development & Engagement. Dr. Reide Corbett, Executive Director, Coastal Studies Institute and Dean, Integrated Coastal Programs, Dr. Ron Mitchelson, Provost and VC for Academic Affairs (L to R) at the entrance to ECU's Outer Banks Campus.

One of the primary goals of this reorganization is to enhance synergy and vitality through improved internal communications and collaborative opportunities to yield innovative research, teaching, and outreach. We intend to more effectively integrate the resources at the ECU Coastal Campus and within the Coastal Studies Institute to help grow our coastal programs at ECU. This can only be done by working in partnership with scientists across ECU's disciplinary departments. We are looking for new and innovative partnerships to better link our impressive coastal instructional and research capacities. Working with ECU's coastal community, we intend to grow the Coastal Campus to 12-15 research-focused faculty with curriculum and research to sustain 20 graduate students and 50 undergraduate students. Undergraduate curricula will be developed with interested departments across campus to include semester long immersive programs like the Summer at the Coast originally developed by Geological Sciences faculty (Walsh and Corbett). ECU is currently re-tooling the interdisciplinary Coastal Resources Management PhD to better align it with the new coastal structure at ECU and to offer more flexibility to the students' program of study while maintaining the focus on integrating natural and social science.

This represents a significant change for ECU and several of its departments. However, we are Pirates and will always seek new adventures and opportunities for exploration. We have set our sights on positive change in an area of historical strength at ECU. With our new focus and strategic direction, ECU will be an internationally recognized leader in interdisciplinary coastal and marine research, education, and engagement!

New Beginnings

James William Eisenmann III, Lab Mechanic, Geological Sciences

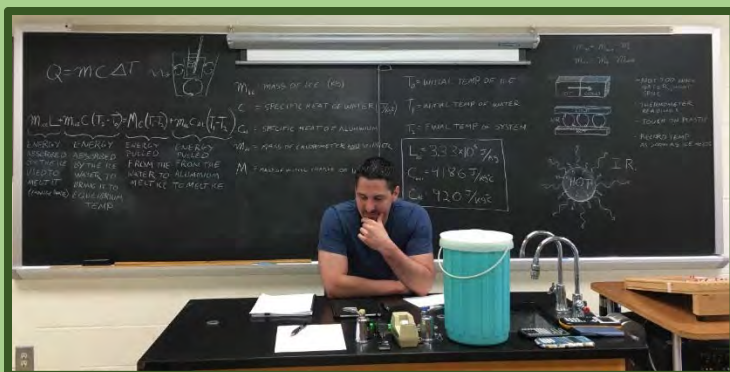
As a child who grew up in Cleveland Ohio, I realized very early on that I was never truly passionate about shoveling snow from driveways, so, when the U.S. Marines landed me on the beaches of North Carolina, I was quick to call this beautiful state my new home. Diving off the NC coast may have had a bit to do with my decision to stick around too!

After I was honorably discharged as a Sergeant of Marines, I went to work for Jarrett Bay Boatworks in Beaufort, NC. This job allowed me to use my electronics and fiber optic experience to do the work of a Marine (nautical) Electrical Technician. A few years later, I realized that I could run my own marine electrical business, but I also thought it would be wise to first learn a thing or two about how to run a proper business! So, while continuing work with Jarrett Bay, I decided to enroll in the business administration curriculum at my local community college.

During my studies in business, I was able to witness a real-life example of an economic recession, and I was laid off from my boat manufacturing position. To shake things up a bit more, about a week after I was laid off, I found out that I was going to become a father to my first and, so far, only child – Ocean Elissa. As you can imagine, this prompted me to change a few small details in my plans.

Fortunately, I learned many important lessons during my time in the military, and one maxim was given to help marines counter the unpredictability of life: “Improvise, adapt, and overcome”. So, I did, and I made a complete overhaul to my long-term goals; I wanted to change my situation to become a better dad to my daughter. I surmised that it would be difficult to be a good and available father if all my time was spent in running a business, so I completely abandoned that idea, and decided to become a teacher. I mean, having summers and holidays off would give me plenty of time to spend with my daughter, right?! Based on that reasoning, I duly enrolled at the community college with the objective of obtaining an Arts degree. But what did I want to teach? Well, I’ve always had an interest in the natural sciences, and I’ve always had a fascination with how the universe worked; therefore, I transferred to East Carolina University with intentions of majoring in physics.

After 12 years of higher education, I finally graduated from ECU with a master’s degree in applied physics. While in graduate school, with the use of ECU’s tandem particle accelerator, I developed a Proton Induced X-Ray Emission (PIXE) analysis system. Among other things, this analysis technique can be used to perform trace elemental analysis of materials such as rocks, minerals, and water. The PIXE system can even perform trace elemental analysis of materials found in the atmosphere!



Currently, I am serving as an adjunct physics professor at Beaufort County Community College and I am a laboratory mechanic for ECU’s Geological Sciences department! I’m excited about the experiences that will accompany my duties with ECU Geology, and I look forward to meeting and working with you all!

~ James William Eisenmann III

New Beginnings

Emily Griffin, the front office face of Geological Sciences

I was born in Rocky Mount and have lived in Greenville since I was a year old. I transferred to ECU in the Fall of 2011 and graduated in the Spring of 2014 with a B.A. in History. After graduation I continued to work my two part-time jobs, one at a construction company in Greenville and the other at Tryon Palace, a state historic site and the first state capital. In April of 2015, I started working full time at C.L. Warters, a commercial plumbing company, as the administrative assistant.

After being in construction for several years, I was ready for a new adventure. I naturally turned to ECU, being a local and alumna. I began with the department in June of 2018. I have been welcomed by all within the department. The faculty are kind and friendly, and the students keep things interesting. I have enjoyed my first semester with the department and am looking forward to many more.

I love spending time with my family, friends, and three dogs. I love to read whenever I can. I am a movie buff and love movies, from classics and musicals to modern action and comedies. I love to run and completed my first half marathon in February of 2018. I enjoy traveling and recently went to Providence and Newport, Rhode Island for the first time.



Terri Woods is retiring (but not from outreach)!

This year has been extremely busy.

John retired last November, our youngest son got married in January, we sold our Greenville house in February and continued to commute between our new house on the OBX and our boat on Broad Creek in Washington, NC so I could teach my classes three days each week. I designed a new oceanography course using a free online textbook, taught an online summer-school course, and spent much of July working on our summer-science camp at the Aurora Fossil Museum. This fall I taught two sections of oceanography plus Min/Pet (a total of ~13 contact hours in three days). Along with a math educator from MSITE, I'm working on a paper for the Journal of Geoscience Education on the mathematics knowledge of incoming geology



New Beginnings

majors and how well our Quantitative Methods course helps address their deficiencies. I am also hoping to complete an article on the effectiveness of the Augmented Reality Sandbox when used to enhance student understanding of topographic maps and surficial processes. My last graduate student is finishing her thesis on using Sr isotopes and MODFLOW to trace vertical movement of groundwater in and out of the Castle Hayne Aquifer.

Because I will retire as of September 1, 2019, I am also working on getting materials from my classes (both online and face-to-face) in good shape for faculty who will be teaching them in the future. Dr. Heimann will be taking over Min/Pet I, Dr. Manda will probably be teaching DE GEOL 1500/1501, and several faculty will teach DE Oceanography. Additional faculty will start teaching Quantitative Methods. I'm not sure what will happen with GEOL 5450 (Aqueous Geochemistry).



After 31 years at ECU I am ready to retire and start spending time at the OBX with John windsurfing, beaching, and sailing. A lot of trips to visit my sons, their wives, and my grandson in the Triangle will also happen. I also plan to do a lot of science outreach in the public schools of eastern North Carolina - maybe involving the Augmented Reality Sandbox quite a bit. I may teach some intro geology courses at a local community college.

I will thoroughly miss interacting with the hundreds of students who enjoyed learning. Teaching such students (both graduate and undergraduate -- in class and in research), along with science outreach, kept me so engrossed over the years that I virtually never found myself watching the clock waiting for the day to end. It sure beat working for a living . . . I admit, though, that I won't miss much about the big intro courses where most of the students seemed totally uninterested. I did enjoy designing those courses (especially the DE variety) and hope that they will prove useful to the department in the future.

I hope I can keep up with most of you on Facebook/LinkedIn, etc. Come and visit us in Colington Harbour.



New Beginnings



Dr. Stephen Moysey

I am excited to join ECU as a new faculty member and the Director of the ECU Water Resources Center. Eastern North Carolina is filled with opportunities to learn about how water impacts our lives and environment. Ever since I was an undergraduate student at the University of Alberta, I have been fascinated by how important water is for maintaining food and energy security, for shaping our communities and landscapes, and supporting all life on Earth! I decided to pursue this interest through a Master's degree in Hydrology and Water Resources at the University of Arizona and a PhD in Geophysics at Stanford University before taking a faculty position at Clemson University. Over the years I have worked on a wide variety of water problems, ranging from water sustainability in India to developing

unique imaging methods to understand flow and transport through soils and aquifers. Since I began studying water over 20 years ago, I have never stopped being fascinated by the complexity and importance of this resource!

The complex, vital role that water plays in our world is exactly why I am so excited to be Director of the Water Resources Center at ECU. I have always been impressed by the interdisciplinary nature of the Bren School at the University of California, Santa Barbara. I see an enormous opportunity for ECU to build a similar interdisciplinary Center focused around water. It is an honor for me to be granted the opportunity to work with our outstanding faculty and dedicated students in pursuing this initiative. We are working to create new research opportunities and infrastructure, creative and engaging educational initiatives, and, most importantly, a caring and supportive community! There are endless opportunities for working in water at ECU – whether you are a student, faculty, alum, or community member, I hope that you will join me in getting your hands wet!





2018 Graduates

B.S. Graduates

Cody Allen
Sybil Basnight
Christopher Biddy
Emma Bouie
Trevor Burns
Jacob Eslinger
Gregory Grissom
Lillian Howie
Derrick Knagge

Joshua Mabarak
Tyler Palochak
Malik Perry
Rebecca Peruso
Evan Pollard
Ethan Rogerson
Megan Salmon
Anthony Stevens
Seth Sutton

M.S. Graduates

Tiffany Cummings
Allison Murrie
Brett Pertunen
Brian Querry
Nina Shmorhun
Michael Twarog

Hydrology and Environmental Certificate

Alex Hammerstrom
Shea McMurry
Brett Pertunen
Nina Shmorhun
Michael Twarog

Congrats Class of 2018!

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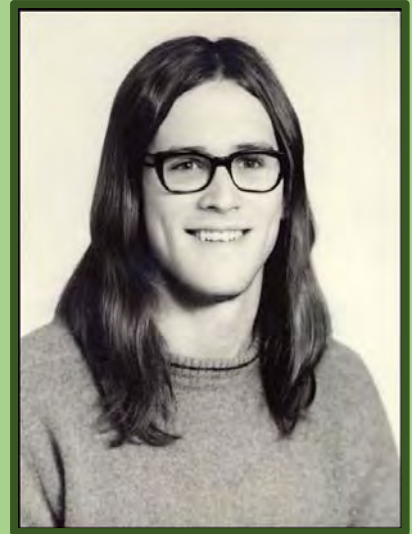
Thank You!

A Special Thanks

A WONDERFUL GIFT!

Jeff Brame recently included the Department in his estate planning with a current gift value of approximately \$300,000. Below, Jeff explains why he decided to include the Department in his plans.

I recently chose to include the Stan and Ann Riggs Foundation within the ECU Department of Geological Sciences in my estate planning. ECU and the Geological Sciences Dept provided me with an incredible education and overall learning experience that led to a successful geological career and enjoyable life. ECU geology professors Stan Riggs and Mike O'Conner had a particularly profound influence on me when they employed me as a field and lab geology research assistant during my last two undergrad years at ECU. Stan and Mike took me as an unfocused sophomore geology major and offered me the beginning instruction and tools necessary to become a disciplined, high quality geological scientist. Stan was particularly instrumental in guiding me with his passion for geology and inspiring me to be the best geologist I could be. The out of classroom experience I received from Stan and Mike completely overhauled and refocused my pursuit of a geological career.



The strong knowledge base and passion for doing geology the right way that I received from Stan Riggs gave me a large part of the foundation to succeed in graduate school and in 42 years as a working professional geologist. Consequently, I felt a strong desire and obligation to show my gratitude to Stan and share my career success with the ECU Geological Sciences Department in the form of a financial support commitment. The Stan and Ann Riggs Foundation became the obvious recipient of my desired commitment, so I could channel my financial support into projects that Stan designed.

I am always proud to tell people that I have an undergraduate geology degree from ECU and that my geological mentor there was Stan Riggs, the best geologist I have ever known and a lifelong friend.



I sincerely encourage other ECU geology alumni to consider including the ECU Department of Geological Sciences in their estate planning.

Jeff Brame

B.S. Geology 1974

Annual Cookout

Please join us for our Annual Cookout!

Meat, drinks, music, and games provided. Bring your own fun!

Saturday, April 28th, 2018, 2pm

Please contact the main office for directions at:

Phone: 252-328-6360

Email: griffinem18@ecu.edu



East Carolina University Foundation Inc.
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