

The Department of Geological Sciences

2021 Newsletter



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SGE Newsletter Meeting 2020

Cover image: an artistic view of Merchants Millpond, site of hydrological research in the past.
Courtesy of Eric Horsman.

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

A YEAR WITH COVID-19

The pandemic has dominated the year since the last Newsletter. Our students were sent home in March 2020 and our faculty had to change their courses, including those with labs, to fully online. We did this over spring break. We got to the end of the spring semester but it was tough on faculty, staff and students alike. We celebrated graduation with our students but it wasn't the same as a face-to-face event. Over the summer we prepared for a fall semester split into two 7.5 week blocks. But fall semester, like the spring, proved to be very tough for all. The students came back to campus but within a couple of weeks, undergraduates were all sent home as the number of COVID-19 cases in the student body spiked. Once more, the faculty had to adapt immediately to the new teaching situation – undergraduate courses online and graduate courses face-to-face. We shall see how we fare during spring semester 2021 as students return to campus and ECU returns to a 15 week semester.

Of course, our teaching is not the only thing affected by the virus. Our research and service efforts have been affected negatively. As I write this message, official travel outside of the state is restricted. But even though we have all sorts of reasons to be down-hearted, I have been so uplifted by the positive attitudes of students, staff and faculty of Geological Sciences. We are all making it up as we go along, adapting to changes, often with little advance notice. Since March 2020, only one complaint has crossed my virtual desk. The teamwork that has been displayed is almost beyond belief. Everyone has stepped up to take on all of the new tasks that have come our way. What a great department to be in!



A chair in the field

A Word from the Chair (cont.)

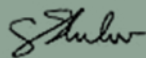
Last year I asked you to look out for the publication of a book that I was editing. It is now published, with a 2021 date, but the title changed to, "Troubled Waters: Understanding the Science Behind our Coastal Crisis". There are several papers by ECU faculty and several are on North Carolina - but the book covers much of the world. It is available in the Springer Climate Series at <https://www.springer.com/series/11741>.

And I'll finish on another high note. You, our alumni, despite all of the things that you have to deal with personally and professionally, have continued to be amazingly supportive during these difficult times. Thank you so much for your continuing donations to the department. They are so important to us.

Thank you to the Newsletter organizing team and to the contributing authors. Thank you also to Stan and Ann Riggs, and the alumni who continue to add to the Riggs' original donation, for supporting this Newsletter.

Please stay safe, and wear a mask.

Steve Culver



Chair of Geological Sciences

January 2021

Adapting

Student Perspectives

ECU Activities Amidst the Pandemic

The COVID-19 pandemic has greatly impacted our ability to socialize with our peers. Although life for most people is quite different now, we have adapted to these changes. Fortunately, we have found new ways to interact with one another while maintaining social distance. After ECU transitioned to virtual learning for the fall semester, activities were made available to students. A series of events were organized for the week of Halloween. Each of the activities were conducted with several safety measures to prevent the spread of the virus and to ensure the safety of participants.

One of the events that were held on campus was an outdoor film screening. Social distancing circles were drawn six feet apart on the Main Campus Student Center lawn with a limit of two people per circle. The attending students were expected to wear masks for the entire duration of the movie.

A make-your-own pumpkin painting event was also held on the Main Campus Student Center lawn. Students were instructed to sign up online and they were sent an email with a time to pick up a pumpkin painting kit to use at home.



Many of the activities were held virtually, like the costume contest, spooky movie trivia, escape room, and bingo events. These events were held through ECU's website, video streams, and Instagram Live.

ECU was effectively able to provide fun and safe activities for its students amidst the pandemic. ECU will likely continue to host similar events in the future while preventing the spread of the coronavirus.

~Mikayla Dixon

Tips for Surviving Online Courses During a Global Pandemic

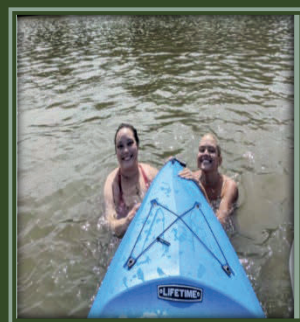
Due to unfortunate circumstances, most courses are still online for Spring 2021 semester. I am going to give some tips on how to survive online classes during a pandemic from my own personal experience. First, never run out of coffee! Seriously though, I would make time for all my classes each day to go through the material that I learned in previous lectures and the material that is relevant from lecture PowerPoints and book material. It's important to act like any assignment is due 12 hours before its actual due date in order to avoid last minute technical issues, or so that I



have enough time to do my best work. I would make sure I had enough time for breaks every day to go outside, exercise, eat and mentally reset myself. When doing online school, keeping up with due dates is a task in itself; so, writing them down and efficiently assigning work for each day of the week is very important. Lastly, one of the most important tips for online school is working with fellow classmates. Working with others allows for differing perspectives on the subject of interest. Online school is a challenge. Especially for science/technical majors like Geology where there are lab-intensive, hands-on courses. All of this being said, I asked several of my fellow classmates for tips they found useful for themselves and others.

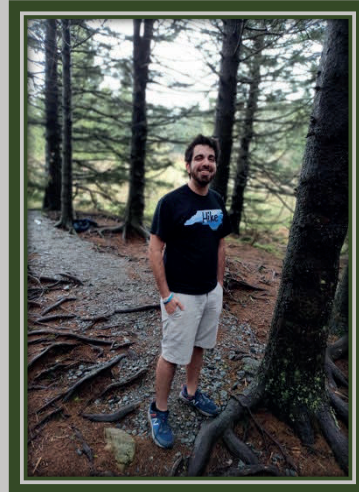
~Regan Styers

Sara Selby is an undergraduate geology student and fellow classmate of mine. Sara felt that the most important tip is to get at least 8 hours of sleep. Long hours of working on a screen and remaining sedentary for a long time can be very tiring. Also of importance, is drinking plenty of water to keep a clear mind and prevent headaches. Due to staring at a screen for most of the day, Sara felt that it is important to get out of the house as much as possible, even if it was just going to the store or have a meal for an hour. Sara found that making time for her own hobbies like walking in nature, playing with her dog named Cassie, or picking up pecans at her family's farm, allowed her to clear her mind.



Danielle Shackleford is an undergraduate geology student and fellow classmate of mine. Danielle said that her online planner application was her best friend while taking online classes. It allowed her to organize her workload for each day and to categorize class times and due dates. Staying positive and keeping good company was essential for Danielle throughout the online semester. Danielle's favorite way to get away from the screen was to get out of the house and walk her dog or swim at the lake with her roommate, which is crucial for surviving online classes during a pandemic.

Lucas Fazzari is an undergraduate geology student and fellow classmate of mine. Lucas felt that the most valid tip for online classes is to work with classmates because hearing other opinions helps him better understand the material. Due to his WebEx meetings being in the mornings, Lucas said waking up at least an hour or so before the meeting is important in order to be attentive, to not fall asleep, and to take valuable notes. Lucas felt that writing all due dates down when they are assigned, as well as never being afraid to ask professors questions over email or WebEx is key to being successful. Although procrastination is always a temptation, Lucas said to not wait until the night the assignment is due to do the assignment. This bypasses late nights or messy work. Lucas's favorite way to get away from the screen is to go for a walk in nature and/or hang out with friends which is important to clear his mind.



Megan Howell is an undergraduate geology student and fellow classmate of mine. Megan felt that using her reminders application on her phone was the most important resource for online school. Megan found that doing small assignments as soon as they are assigned helps to prevent procrastination. Many assignments are due throughout the week, so Megan established that spreading out her workload was a valuable strategy when planning out her week. Getting at least 6 hours of sleep and keeping a positive mindset allowed Megan to stay on top of her work. Megan's favorite way to get away from the long screen hours is to read an entertaining book and watch Netflix with her roommate.



Different ≠ Difficult

In a world of uncertainty, our familiar routines provide us with a semblance of security. We seek comfort from stress caused by the unknown in our daily schedules, habitual practices and established methods. Negative changes that force us to modify our conventional way of doing things are often unwelcome and looked upon with scorn. Though such changes are unpleasant, they often foster innovative thinking, highlight the dedicated and strengthen resolve. Among the uncertainty of the current pandemic, the students and faculty of the Department of Geological Sciences have been a prime example of how adverse change can strengthen the truly committed individual.

Online instruction has provided professors with an opportunity to update the methods in which their courses are taught, leading to new and exciting technology-based lectures and assignments. As a result, students have learned how to effectively engage in virtual collaboration with their peers and professors. Virtual labs have given students a chance to become proficient in software they will use during their careers. The block scheduling strengthened time management skills along with preparing students for the strenuous deadlines often encountered in the work-place.

The changes that occurred during the past year due to the pandemic challenged us as a department. However, the faculty, staff and students displayed admirable tenacity in adapting to those changes. As we prepare for the upcoming academic year, we are now armed with the knowledge that though things are different they do not have to be difficult.



~Felicia Edwards

A New Way of Doing Things

Field work

We Shall Fight for the Field

Although the current state of the world can make us feel as though everything around us has frozen in time, the field work continuing to be done in the department of Geological Sciences serves as a shining example of how life can still go on. The campus shutdown and new CDC Guidelines presented a challenge to performing field work. But, thanks to the adaptability and tenacity of our staff, faculty and students, this extremely important part of our research and education endures, although, rarely in the same form. Because classes were each effected differently, a range of different changes were made. Some classes, like Dr. O'Driscoll's Geology of Drainage Basins graduate course, were fortunate enough to squeeze in experiences before the fall semester shut-down here on campus. This allowed the class to get an up-close view of our city's Town Creek culvert rehabilitation program.



mine's history and operation as well as observing the surrounding geologic formations. This year, however, students who wished to take the trip were required to drive to the mine independently and to wear face-masks for the duration of their visit.

Unfortunately, other courses weren't as lucky and had to adapt. Voluntary field trips were one of the ways that professors got their students in the field. For example, Dr. Heimann's Mineralogy & Petrology II class took their annual trip to the Gold Rock Quarry. Thanks to the generosity of the Wakestone Corporation and Mr. David Lee, Dr. Heimann's students are able to visit the mine each semester.

Normally students would travel as a class and learn about the



Still some other classes fully embraced the online culture of the previous semester. Every year students in Dr. Rigby's Sedimentology class are expected to create a report on the sedimentary structures found in and around the Tar River and Shackleford Banks. In order to simulate the experience of sampling these locations, Dr. Rigby truly went the extra mile in digitizing the entire trip. The virtual field trip taken by the students included video journals detailing the path taken to the individual formations and processes used to collect samples. The trip also included cross-sectional data and field samples collected by Dr. Rigby that were correlated with GPS data to give the students a full understanding of how the flow dynamics in the area effected the studied formations and vice versa.



Other field work has been almost unaffected by the campus shutdown. For example, in some cases, graduate research and the field work associated with it can continue with little change because of the limited group of interacting students and faculty/staff. Dr. Bell of the

ECU Water Resources Center, housed in Graham, has three students working on a denitrifying bioreactor project. Currently, the three are working socially distanced in the lab, but they plan to start field testing on the West Research Campus in the Spring semester.



These are trying times for everyone, but the department of Geologic Sciences is facing it head-on with innovation and adaptation. We won't let adversity keep us from getting out and doing the hands-on science that it is essential for future Earth scientists to learn and push the limits of what we know. A mask won't stop a geologist!

~Eric Teabo

A Virtual Geology Field Course: A true 2020 experience

A virtual field geology course is something of an oxymoron, but when presented with the world of 2020 and the COVID-19 epidemic, it was what was required and indeed, needed for this moment. Field geology traditionally has been about teaching students to interpret what they see at an outcrop and understanding how these individual exposures fit together into a larger whole. It is about solving a geologic puzzle, and applying skills a student has learned throughout one's geoscience education and creating an integrated scientific interpretation and product. Ultimately all of the geosciences are tied into field observations because that is where the literal ground truth exists. The field course is a capstone experience for upper level geology majors and one that is critical for their future success. So therefore, we can ask the question, "What is the best way to teach geology and to teach these integrative skills if one cannot go into the field?" That was the question that 2020 forced us to ask.

Our answer was to present students with project-based learning in a digital environment. The traditional, in person, ECU field course has been based in New Mexico and southern Colorado, and the virtual field course was as well. The goal was to give students as in-depth an experience as was possible in this format. The course had three major mapping projects, a stratigraphy project and geophysics exercise in which students used gravity data to interpret the structure of the Rio Grande Rift. In addition, students were taken on a number of virtual field trips throughout the region using tools such as GIS software, Google Earth and Street view, hundreds of existing field photographs, and digital Photospheres that place a student virtually at a particular outcrop.

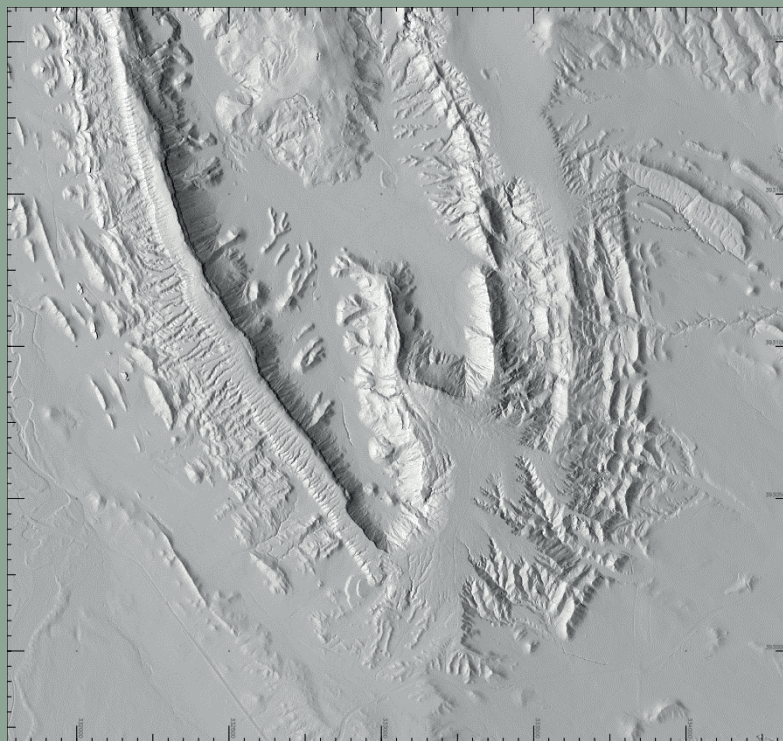


Figure 1: High resolution digital elevation model (DEM) of the White Mesa/San Ysidro mapping area that students used to interpret structures and draft cross-sections.

The first of the mapping projects was at White Mesa near San Ysidro in New Mexico. This is one of the traditional ECU mapping locations and one many generations of past ECU students, including some likely reading this article, have been to. At this location, students did a geologic tour of the area based on geolocated field photos, videos and remote sensing data. There was also a virtual reality (VR) component based on Google Photospheres as mentioned above. In addition, students received structural and lithology data, previously collected in the field, and from that had to build a map, draft a cross-section and write a geologic report/paper. To accomplish the above goals, students used a variety of software-based tools including Google Earth, GRASS GIS, Adobe Illustrator, Excel and Stereo Plot.

To give you the reader, an example of this type of digital experience we've included a link to a relevant Google Photo Sphere at White Mesa. Some of you may have been to this location. Use the link below, and see what you can identify!



Figure 2: White Mesa / San Ysidro mapping area. This location introduced students to the Mesozoic stratigraphy of northern New Mexico. It is also a still image from Photosphere below.

Google Photosphere link:

<https://earth.google.com/web/@35.5073253,-106.8395995,1834.76306968a,0d,60y,332.34258029h,68.22533951t,0r/data=!i8KK0FGMVFcE1IY2Zub2lpbVJaaU9KRzc1UU1JOGtIV2xHNy1jZGs0eHnrY2cQBQ>

This location is the high point in the White Mesa mapping area and provides a good visual overview of the structure. You can actually see the elevation benchmark on the ground (look down). What students were able to observe at this location is that while looking north (up the valley) strata on the east side dip to the east and strata on the west side dip to the west. If familiar with what the different units look like, students were also able to observe and map unit contacts. The reddish rocks in the valley floor are the siltstones and shale of the Triassic Chinle Formation. The Jurassic Entrada sandstone is the first unit up the valley walls. However, the Entrada is somewhat different at White Mesa/San Ysidro than many other locations in that it is not a strong cliff-former here, whereas in most locations it is. Above the Entrada is the diagnostic Todilto Formation, which is identifiable by massive white gypsum layers. In the Photosphere, one is standing on a near horizontal layer of gypsum. Hopefully, this gives you an example of what modern technology is able to do in terms of bringing field geology into your computer.

In addition to the integrative digital geologic experience that the students received in the class, the course received positive press as an example of how the university adapted to the travel constrained conditions of the pandemic. To this end, the ECU News service produced the following article on the course by Lacey L. Gray. <https://news.ecu.edu/2020/06/30/digital-field-experience/>. We encourage you to use this link and further read about experiences of students who participated in the 2020 ECU virtual Geology Field course.



~David W. Farris

The Joys of Fieldwork in 2020

I am sure I am not alone when I say that getting into the field is a highlight of working in geoscience during normal times. There is an adage that I wholeheartedly relate to—“A bad day on the water is better than a good day in the office”. And we didn’t have any bad days on the water or in the field during this year’s fieldwork season.

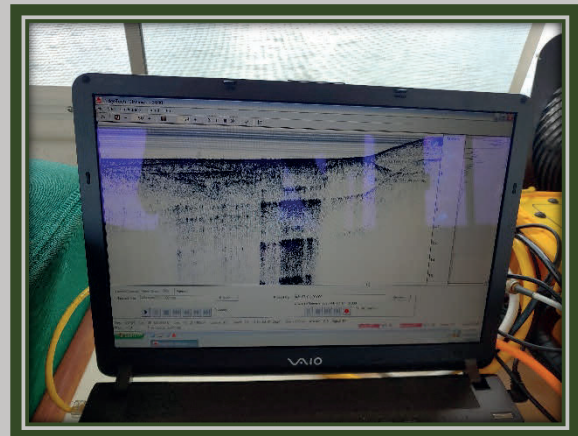


Scott Rose operates the Geoprobe while Dr. Dave Mallinson and graduate student Erik Gudmunson enjoy the view on the north shore of the Albemarle Sound

Scott Rose and I, the department’s lab mechanics, had the pleasure of being a part of field work in and around the Neuse River and Albemarle Sound this year. On land we cored with the Geoprobe and on the water we conducted CHIRP surveys and cored with the Vibracore system. CHIRP surveys were run off of the vessel *Tomcat*, a 25’ C-Dory, and vibracoring was done off of the *Work Barge*, a 28’ Hanko. On the Neuse, we worked primarily between Arapahoe and Oriental, encountering many recreational boaters while on the water and ferocious mosquitoes while on land. The field area on the Albemarle Sound was immense, spanning from Edenton to where the Pasquotank River meets the sound. We had to work around summer afternoon thunderstorms that sprung up with rapidity on both bodies of water.



(Left): Erik Gudmunson prepares the CHIRP Sub-bottom Profiler for deployment on a calm day on the Albemarle Sound. (Right): Raw data from the CHIRP system on the Albemarle Sound showing paleochannels and shallowing water depths.



Beyond the usual relishing, going into the field since March has been a much-welcomed reprieve from the isolation and atypical situations we all find ourselves in. That’s not to say it wasn’t without its challenges and added complications, like all aspects of our current lives. We limited our interaction with the public and had reduced capacity on vessels and in vehicles to allow for social distancing. But it was a great comfort to get out under the wide sky and know that some things are always a constant—Earth is still spinning, the tides are still pulling, and fieldwork is good for the soul.

~Marah R. Dahn

Inside Looking Out

Staff and Faculty

The ECU Water Resources Center During a Unique First Year

Looking back over this difficult year, what have we learned? On February 11, 2020 I was presenting at a conference in San Diego. I was a bit nervous about going because there was news of a virus outbreak in China, the CDC declared a public health emergency on February 3, and the thirteenth case of COVID-19 was diagnosed in the USA on February 10. Passing through the Seattle airport as I changed flights on the way home, I felt wary but was grateful to Adobe for providing us all with a small package of disinfecting wipes at the conference. I recall being nervous about the sick person who was sitting behind me on the next flight. That was before we had masks, social distancing, or any awareness whatsoever about what was to come. I did get quite sick after that trip and had to cancel a couple of classes and miss a faculty meeting (well, despite being sick I wouldn't say I was "missing it"). I was feeling better within a few days and at that time we did not yet have widespread testing, so who knows what I had? But given that soon after I had to take my kids to the bizarre plastic-sheeted tunnel that had become our doctor's office, where the nurses were practically wearing hazmat suits, I was nervous. My family was diagnosed with garden variety flu and strep throat, so we are pretty sure that we dodged a bullet and did not have COVID-19, but we still don't know for certain. Shortly after, we had European friends who were living in Toronto visit us as part of an extended trip to the USA. We were enjoying lunch together at Coastal Fog when we huddled around smartphones to hear the news that Justin Trudeau was closing the Canadian border that day at midnight to all except Canadian citizens. Being Swiss citizens, our friends had to immediately get in their car and drive home since they did not know if they would be let back in the country after the closure. Things went downhill pretty fast from there with full lockdowns and the rest, as they say, is history.

I recount those initial few weeks to emphasize that by the time we went to lockdown, I was already terrified of COVID-19 and living in fear. Many of us were in shock. It was hard to imagine how we could go on. And yet right from those early days of the lockdown, I recall a great deal of collegiality and determination to keep going at ECU. The Water Resources Center moved "coffee time" online so the community could continue to catch up with each other despite being forced apart. Earlier than I thought possible, people began finding ways to safely get back in the lab and field to keep moving their research forward. It was inspiring to see the dedication and careful behavior of faculty and students as projects moved forward, equipment was installed, and facilities were maintained despite the shutdown. John Hoben worked tirelessly to keep interns at the Center engaged from home and eventually in the lab and field once it became possible. Natasha Bell installed a new Lachat flow injection analysis system in the WRC lab, thereby significantly enhancing the Center's water quality analysis capabilities. Progress was made on further building the test site at the West Research Campus, with multiple stations deployed to collect real-time soil and

groundwater data at the site. These pieces of infrastructure not only help build the research capacity at the Center, but are also supporting teaching. The data from the West Research Campus are being integrated into multiple courses in Geology, Engineering, and Biology. Last fall the Lachat provided John an opportunity to test-run a new internship program that he plans to build through the Center. I can't begin to list all of the work that people have put in on individual projects, but it is truly impressive to see how much research has happened over the past eight months despite the restrictions and brief scares with exposures. And of course, proposals continued to roll out the door. One of the most exciting to me was a large-scale project with over 20 faculty from seven universities focused on working with communities in eastern North Carolina to tackle environmental justice issues. Being forced to work online has its challenges, but Zoom and other online collaboration tools have also increased our ability to collaborate within and outside of ECU. We are entering a new world in terms of what work will look like beyond the end of the pandemic and this bodes well for broadening ECU's research reach and standing at a national scale.

So, what has been learned from the last year? I have learned that ECU is full of exceptional faculty and students who won't let a global pandemic stop them! I have learned that being in the same physical space isn't as important as being united in common purpose and shared experience – even if this is online. I have seen how empathy, understanding, and compassion for each other can pull us up even when we are down. I have learned that our community is the greatest asset that ECU has. But that is something that I already knew and am grateful for.

It is impossible to comprehend the challenges, loss, and fear that some have had to struggle with this past year. As we all learn to adapt and live through the continuing pandemic, I look forward to a 2021 that leaves fear behind. I vow not to “hope” for what may come from the future, but rather to draw on the inspiration that together we can *DO* great things every single day.

~ Dr. Stephen Moysey,
ECU Water Resources Center Director

Science and Art in the Time of COVID-19

When the pandemic arrived at North Carolina's doorstep in March of 2020, students enrolled in GEOL 1400 (*Beaches and Bays Around the World*) were away, traveling on spring break. A bit ironic, as GEOL 1400 is part of the curriculum offered in ECU's Semester at the Coast (S@tC) residency program on the Outer Banks, which is normally a spring-break destination. Students in the semester-long S@tC residency program participate in field- and classroom-based coursework at the Coastal Studies Institute (CSI) each spring. Course credits earned during the semester-long program contribute to an interdisciplinary minor in Coastal and Marine Studies, and offers students the opportunity to gain work experience through coastal-based service or research internships while taking classes at CSI.

Because it is a general education course for non-majors, GEOL 1400 attracts students from diverse backgrounds and across all majors. This makes *Beaches and Bays* one of my favorite courses to teach. Through virtual and live field trips, students explore different coastal environments locally and around the world to answer the question: *why do coastal systems look so different from place to place and why are they important, even if I don't live on one?* My goal is that by the end of the class students will have a better understanding of the interlinked geologic, hydrologic, ecologic, and human processes shaping our coastal systems. Becoming a science-literate citizen while also having fun is also a way to recruit Geology majors.



Figure 1. Marco Agostini (Computer Sciences) building his 3D diorama of the Gironde and Reloncavé estuaries

Over the 2020 spring-break, the face-to face S@tC experience came to an abrupt halt as students were required to move out of their dorm facility on the Outer Banks. Just like classes across the U.S., *Beaches and Bays* was necessarily transformed to an online class. This shift required faculty and students alike to immediately adapt their approach to teaching and learning. With half the semester to go, I took a long, hard, look at what I had assigned as final semester projects. Originally conceived as papers and a presentations to their classmates—a typical way to assess student learning in science classes—it now seemed like a tired assignment given that our students would no longer be on the Outer Banks. The final assignment required students to compare two coastal case studies, the locations of which they drew out of a hat before the pandemic. Wanting to find a way to somehow offer a memorable virtual learning experience that reflects the innovative S@tC approach to education, I decided to shift the final project format from journal-style papers and mock conference presentations to Creative Science Communication pieces.



Students were tasked with designing and building a creative project that demonstrated their understanding of their two case studies. A children's book; a painting or sculpture; a poem; a short story or graphic novel; a blog; a board game, or even stylized baked goods, students were given free-reign over the medium by which they communicated aspects of their case studies. Regardless of the media selected, these final projects were to demonstrate student understanding of the geologic history, tectonic setting, source of sediments or nutrients, hydrologic dynamics (including tides, waves, storms, river floods, longshore drift, currents), ecology, sea level changes, weather and climate processes, and the human impacts shaping their two coastal case studies. Along with photos and videos of their final pieces, each student wrote or recorded a description of what their final product conveys and included a list of references they consulted when researching their case studies. The results were a success, proving to be fun and rewarding for both students and their instructor! In fact, I was so inspired by ECU students' flexibility and creative resilience, that I have decided to incorporate this exercise into GEOL 1400 every year.

~ Dr. Kimberly Rogers,
Assistant Professor of Coastal Studies



Figure 2. Clay monuments of the Fly River and Mekong Deltas, by Lauren Wright (Anthropology)

Graduate Program Endeavors

Graduate Education and Research During the Pandemic

Many aspects of our graduate programs (the M.S. in Geology and the Certificate in Hydrogeology and the Environment) have of course been dramatically impacted by the pandemic. While the changes have been tough to acclimate to, the rethinking of our daily operations that was forced upon us has produced some important lessons and reminders. I describe a few of these below.

The March 2020 lockdown meant that essentially all courses were immediately switched to an online format. For example, the graduate-level introduction to geophysics course that Dave Mallinson and I were co-teaching suddenly had to continue forward with virtual lectures and, more significantly, labs, rather than real-world data collection experiences. I was impressed by the resilience displayed by our students in the midst of so much sudden change.

In the fall and spring semesters of the current academic year, many of our graduate courses met face-to-face due to their relatively small class sizes. I'm teaching a face-to-face graduate course right now, and I think all of us are happy to have a taste of familiar classroom circumstances.

Our approach to research has had to evolve, too. Early restrictions on travel and access to on-campus facilities dramatically impacted many of our graduate students. For example, many students had difficulty accessing and processing their samples in our lab facilities in a timely manner. Similarly, due to travel restrictions, one student working with me had to entirely change the field area for his research project (from Utah to West Virginia) after a full year of reading, writing, and preparation. The student has done a tremendous job and is still on track to finish his degree according to our original pre-pandemic schedule. It's impressive to see how students and faculty worked diligently to adjust plans, develop safety protocols, and generally do whatever is necessary to allow research to move forward.

These efforts have produced tangible results. I am happy to report that, despite the difficult circumstances, the graduate students in our programs have continued to succeed. For example, we graduated six M.S. students in Summer and Fall 2020, and all of them presented and defended their theses entirely online. We fully expect several more students to finish their degrees in Spring 2021.

I'm very optimistic about the job prospects for these graduates – employers seem to be hiring! I've been interacting quite a bit with prospective employers who want to know more about our upcoming and recent graduates. Similarly, I've interacted with quite a few alumni who have found new and better positions in recent months. I find this tremendously encouraging and inspiring.



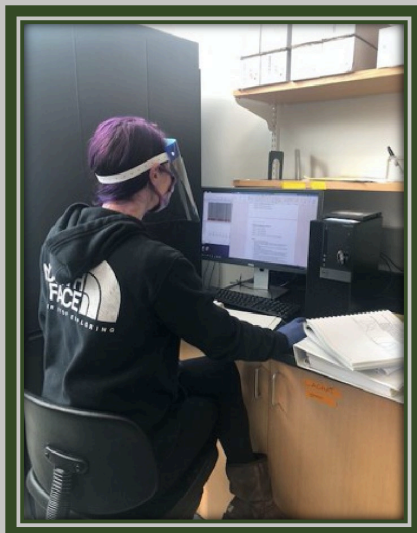
To help keep myself and my family sane, we've been trying to find some safe ways to incorporate novelty and small adventures into daily life. We took a great canoe camping trip to Merchants Millpond State Park in November 2020, and thoroughly enjoyed ourselves. I hope you and yours are able to find ways that work for you to make the best of your circumstances.

~ Eric Horsman

Graduate Research During COVID-19

Graduate research in the earth sciences is typically carried out with months, often years of fieldwork, lab work, and collaboration with other scientists. Prior to 2020, it was normal to hold team meetings in person. Having to share a small workspace in the lab was a just another Tuesday. Carpooling six people in a van to a field site an hour away was encouraged, as we're all environmentalists! Prior to the pandemic, campus was buzzing day and night. Thousands of students shared the same labs, classrooms, office spaces, hallways, and bathrooms without a second thought.

But since 2020, sharing spaces with other people is strongly discouraged. Meetings are held from the safety of home on Zoom, WebEx or Teams. Time in the lab must be reserved ahead of time, to minimize occupants. When driving to a field site, vehicles are not to sit more than three people, and those three people must keep the windows down and their masks on. Ever since the pandemic, ECU's once lively campus is desolate. Walking through this ghost town serves as a solemn reminder of the 2 million lives claimed worldwide by COVID-19 last year.

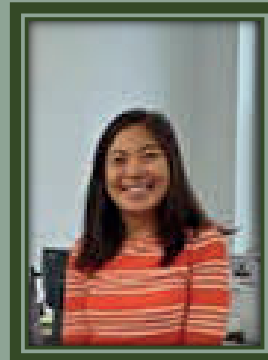


There are a lot of new rules that we've all had to learn to follow since the pandemic. Sometimes they make research more difficult, but we abide by them happily because here at ECU, we respect each other's health and believe everyone deserves to learn in a safe environment.

~ Ann Marie Lindley

Newest Bell to the Ball

ABOUT ME: Dr. Natasha Bell



Assistant Professor in ECU Department of Engineering
(Environmental concentration area)

Faculty Affiliate of ECU Water Resources Center

Education:

Clemson University

- B.S. Biosystems Engineering

University of Illinois at Urbana-Champaign

- M.S. Agricultural and Biological Engineering
(concentration in Soil and Water Resources Engineering)

Clemson University

- Ph.D. Biosystems Engineering

Work Experience: Between earning my MS and PhD degrees, I worked for two years as a civil and environmental engineer for a consulting firm in New York City.

Fun Fact: Dr. Bell is the first female in the ECU Engineering Dept to have earned her Professional Engineers Licensure

What are your primary research interests?

My research takes an ecological engineering approach to development of water remediation and reuse strategies that inform decision-making within the water-energy-food nexus. In my lab, we investigate hydrologic and biogeochemical properties of green infrastructure, including constructed wetlands and subsurface bioreactors, which leverage the inherent mechanisms of microorganisms and plants to remediate point and nonpoint source pollutants.

What kinds of things do you do with the Water Resources Center?

As a faculty affiliate of the ECU Water Resources Center (WRC), I collaborate with faculty, staff, and students on multidisciplinary research and teaching projects focused on bettering the quality of waters in NC and beyond. Some of our ongoing collaborative projects include growing research infrastructure at the ECU West Research Campus and expanding community-wide surface waters and green stormwater infrastructure monitoring efforts. I stay engaged with the WRC community by participating in local outreach activities, journal club, coffee hour, and other social activities.

How has the pandemic affected the ways in which you conduct your research here at ECU? (lab work, field work, meetings, etc.)

Due to the pandemic, my research group has been forced to slow down, reevaluate, and adjust. We've adjusted our schedules to allow for only a limited number of students working in the lab at a time for proper social distancing. We've also pivoted to online weekly research meetings rather than in-person. Fortunately, we've been able to continue our work building the Ecological Engineering Outdoor Lab at the West Research Campus (more information will be posted here: <https://campusoperations.ecu.edu/sustainability/natural-areas/>).

Recognition of 50 years of research, teaching and service by Stan Riggs

Late in 2020, Stan Riggs was awarded the SEPM Francis P. Shepard Medal For Sustained Excellence in Marine Geology for 2021.

Stan, Emeritus currently Distinguished Professor in the Department of Geological Sciences, graduated from Beloit College in 1960 with a BS in Geology, from Dartmouth College in 1962 with a MS in geology and he earned a PhD in Geology from the University of Montana in 1967.

Stan's early research on onshore and offshore phosphorites was of immense value to many developing countries. He was awarded the Oliver Max Gardner Award in 1983 for the single faculty member in the University of North Carolina system who has "made the greatest contribution to the welfare of the human race." From 1984 to 1988 he was Co-Director of IGCP 156—Phosphorites. A commentator stated, "I doubt if there is a country in the world that has not benefited from the work of Project 156 through the publications, training, and expertise".

Since 1967, Stan's research on the coastal geology of North Carolina has been broadly applicable to barrier island coastal systems around the world. In 2000 he codesigned, and then led for over a decade, a USGS-funded multi-institutional cooperative that resulted in ca. 70 peer-reviewed publications, ca. 180 abstracts, 4 PhDs and 31 Master's degrees from ECU alone.

Stan has a deep conviction that scientific research should be not only relevant to humankind but also communicated beyond the world of academia. Among many appointments, he served on the NC Governor's Committee on Marine Natural Resources in the early 1970s, the State Emergency Response Team for the NC Division of Emergency Management (1998-2003), and the NC Legislative Commission on Global Climate Change (2005-2011). In 2013, he founded "North Carolina Land of Water", a non-profit organization whose mission is to enable the long-term, sustainable economic development of coastal North Carolina through wise management of natural resources.

In addition to teaching his many students for some 50 years, Stan's educational efforts have reached far and wide. He has lectured and led field trips for numerous teacher-training workshops that introduce high school educators to coastal processes. Stan has also got the word out on coastal processes and climate change through many documentaries on NC public television. Through his skills as a communicator, Stan's scientific research will influence the management of our coasts for decades to come.



2020 Graduates

B.S. Graduates

Colby Brown

Matthew Clark

Felicia Edwards

Sidney Green

Jordan Harrell

Ann Marie Lindley

Jamil Millner

Samantha Bowyer Moore

Trace Oglesby

Jennifer Richardson

Charlie Skiptunas

Dakota Spurley

David Stewart

Josie Sullivan

Patrick Tomasic

Bobby Vaughan

Taylor Williams

M.S. Graduates

Natasha Biarrieta

Tanner Eischen

Casey Gilleland

Daniel Gray

Jonathan Prevatte

Kyle Prock

Cody Shell

Seth Sutton

David Sybert

Congrats Class of 2020!

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