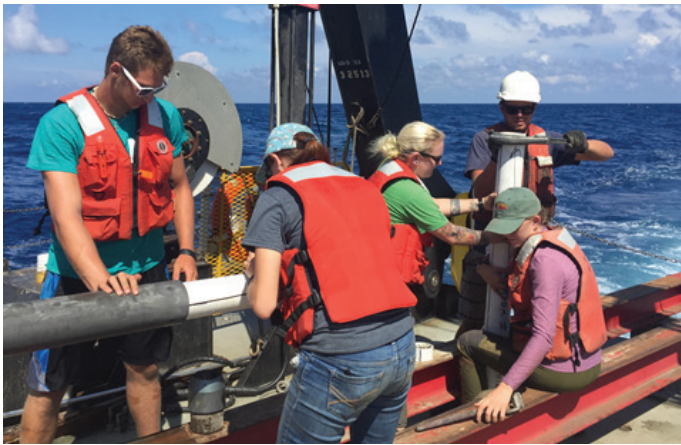


# The Coastal Current

The School of the Coastal Environment Newsletter



## FAST FACTS

### MSCI Undergraduate

Fall 2017:	
Freshmen	350
Sophomores	216
Juniors	162
Seniors	173
Total	901

### Spring 2018:

Freshmen	209
Sophomores	193
Juniors	166
Seniors	178
Total	746

### CMSS Graduate

Fall 2017:	
CMWS Students:	32
Ph.D. Students	10
Non-degree Seeking	5
Total	47

### Spring 2018:

CMWS Students	37
Ph.D. Students	10
Non-degree Seeking	2
Total	49

As of Spring 2018, 66.9 percent of MSCI majors are female and 33.1 percent are male.

According to a 2016 CMSS Baseline Assessment, within one year of graduation, 71.4 percent of students were employed. Of those, 83.3 percent believe their job is related to their graduate degree.

## Icebergs off the S.C. Coast? see page 4

### A note from the vice dean about science communication

The School of the Coastal Environment is now 1.5 years old. Some of the plans associated with forming the school have indeed been put into action, and hopefully more progress will be made during the upcoming semester. All of the proposed changes were done with the goal of delivering the highest quality undergraduate and graduate degrees.

One of the changes that was made during Fall 2017 concerned the job duties of graduate assistants. Specifically, it was decided that graduate students should be developing their teaching and communication skills, as such skills are valued across the spectrum of careers in the coastal and marine sciences. As such, many were assigned to teaching or tutoring duties in the Department of Marine Science.

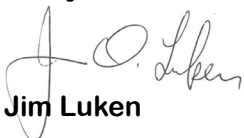
To help graduate students in the process of becoming excellent teachers, we designed and offered a required orientation session on classroom policies and strategies. We paired graduate assistants with faculty supervisors. And of course, graduate students were evaluated as a way to give them constructive feedback.

All of us, even seasoned college teachers, understand that the teaching of a subject is the best way to learn a subject. It is my belief that graduate students can be a tremendous asset to the undergraduate program as they show their enthusiasm for research and the discipline. This enthusiasm can be inspirational for undergraduates who may still be trying to decide their majors or career paths.

We have many gifted and dedicated teachers here at CCU, and I urge the graduate students to seek out these individuals and hear their wisdom regarding successful teaching. As you complete your research, always remember that science not communicated or not communicated well will languish.



Jim Luken

  
Jim Luken

Interim Vice Dean  
Associate Provost of Graduate Studies

# Undergraduate Spotlight



Arrington collecting water-quality data



Arrington analyzing samples

Hunter Brooke Arrington, a junior at CCU double majoring in marine science and biology, is an enthusiastic high-flier in the School of the Coastal Environment. In the past few years, she has shown exceptional growth as a student and a researcher. Arrington's interests have grown, or shrunk depending on your perspective, from her passion for sea turtles to her fascination with marine microbial ecology.

Arrington had her first introduction to research in marine microbiology under Megan Cevasco, Ph.D. She assisted Cevasco in her research on kleptoplastic foramanifera, investigating how and to what extent these amoeboid protists use retained chloroplasts from ingested organisms. Arrington learned and practiced essential lab techniques by designing primers for polymerase chain reactions and culturing diatoms.

Further developing her skills, Arrington began working for the Environmental Quality Lab with Susan Libes, Ph.D., where she tests the water quality of North Myrtle and Myrtle Beach swash sites by examining the concentration of fecal bacteria in these zones. She helps to monitor these concentrations year-round for the S.C. Department of Health and Environmental Control. Libes commended Arrington's hard work, saying, "Hunter is a very valuable member, because she has been able to get trained on quite a few of our water-quality testing methods. The hands-on experience that Hunter has gotten in the EQL adds skills to her resume and experience in performing water-quality research." This well-rounded skillset includes collecting, analyzing and properly disposing of samples.

In addition to her research, Arrington is involved with the surrounding community. For the last two summers, Arrington volunteered with the Waties Island Sea Turtle Monitors, a turtle nest monitoring program on the northern-most beach of South Carolina. Arrington is also a yoga instructor at the HTC Center on CCU's campus, where she leads a beginner course in Ashtanga Vinyasa Yoga.

According to Arrington, the marine science undergraduate program allows students to gain a diverse background while being able to focus on a specific field of study. Because the program is diverse, there are research opportunities in the same area of a student's interest. Arrington advises new CCU marine science students to talk to their adviser and reach out to professors and get involved. "If a certain topic gets you excited and gives you goosebumps, don't ignore it, follow up on it!"

## Graduate Spotlight

During the summers, graduate students of the School of the Coastal Environment are up to a multitude of activities: local, regional and international research; jobs involving their area of expertise; data compilation and analysis; and/or report, thesis or dissertation writing. Some, like coastal marine and wetland studies (CMWS) student **Matt Stanek**, find internships to gain experience in their field. Researching under professors Erin Hackett, Ph.D., and Roi Gurka, Ph.D., Stanek landed a 10-week internship at the Naval Surface Warfare Center Carderock Detachment in Norfolk, Va., for the summer of 2017.

Stanek attended Randolph-Macon College, a small liberal arts school in Ashland, Va., where he earned a Bachelor of Science in engineering physics, environmental studies and political science. Stanek is currently working toward his M.S. in CMWS, researching in CCU's Environmental



Fluids Laboratory. His research includes studying turbulent boundary layers in open channel flow to characterize the lab's recirculating flume. His thesis research helped to prepare Stanek for the internship in Carderock where he could take his studies outside of the classroom. "It provided insight into a typical day for a civilian scientist for the Department of Defense," Stanek said.

Stanek's day-to-day work varied while he was in Virginia. He spent time at both the Joint Expeditionary Base Little Creek and Naval Station Norfolk and performed many duties, including material testing, writing recommendation reports, and small-craft testing in the waters surrounding the naval base.

When asked how this internship impacted his work as a graduate student, Stanek replied, "My internship experience put into perspective the applications of boundary layer development and how they affect various aspects of naval architecture." As a student in a real-world setting, Stanek was able to gain invaluable experiences and network for future jobs.

**“[My internship] provided insight into a typical day for a civilian scientist for the Department of Defense.”**

# Icebergs off the S.C. Coast? A Coastal Research Cruise

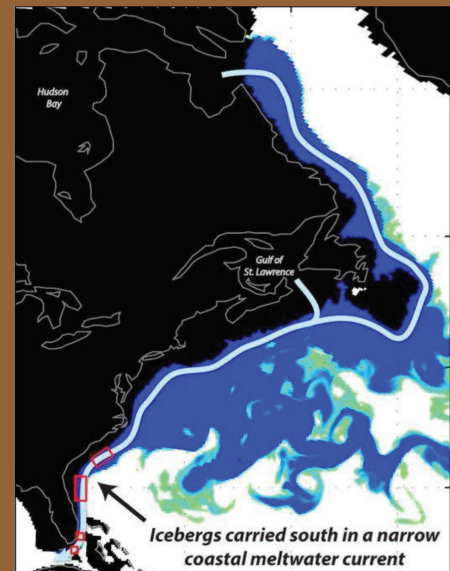


Left to right: TR Marshall (R/V Sharp crew), Dan Baker, Nick Conway, Cathryn Wheaton, Jess Myers, JT Durica, Richard Viso, Jenna Hill, Lili Clark, Brian Stillie (OSU)

On the evening of Aug. 15, 2017, two faculty, two CMWS graduate students, and four undergraduates from the School of the Coastal Environment (SCE) set sail on the University of Delaware's R/V Hugh R. Sharp. The objective of the cruise was to collect data on a decade-old mission to discover whether icebergs once extended into South Carolina. The participants of the research cruise (Jenna Hill, Ph.D.; Richard Viso, Ph.D.; CMWS graduates Nick Conway and Cathryn Wheaton; and MSCI undergraduates Lili Clark, Jess Myers, JT Durica and Dan Baker) worked with cutting-edge technologies on an arduous schedule in hopes of ultimately developing a time interval for the formation of iceberg scours off the South Carolina coast.

The mastermind of the operation, Jenna Hill, Ph.D., first observed unexpected features on the sea bottom while performing habitat mapping using high-resolution multibeam bathymetry equipment. She hypothesized that these features are iceberg scours, or scars caused by icebergs scraping the seafloor. Through further research, she proposed that icebergs may have extended as far as southern Florida during the last glacial maximum. In a colder, yet thawing, climate, scientists hypothesized that freshwaters being introduced in the upper latitudes could have disrupted thermohaline circulation and ultimately slowed down the Gulf Stream. With a weaker Gulf Stream, countercurrents closer to shore may have allowed icebergs to flow even farther south than previously thought.

With funding from National Science Foundation (NSF), Hill led a team of CCU students to collect sediment cores in an attempt to estimate a time interval on the formation of the proposed iceberg scours. However, a major caveat to this plan is that South Carolina is a sediment-starved environment, leaving only patchy areas of sandy sediment to core. Viso points out that coring sandy sediment is problematic because the large grain size may not allow the sediment to pack well enough to sample. Wheaton said, "We weren't sure we would actually collect any sediment in the cores, because very few studies have been successful in collecting deep water, sandy cores off the S.C. coast." Viso also expressed his concern, saying it was a gamble as to whether they could collect an accurate sample of the scour surface.



Southerly currents (blue line) carried icebergs (red boxes) as far south as Florida. Credit: Alan Condron

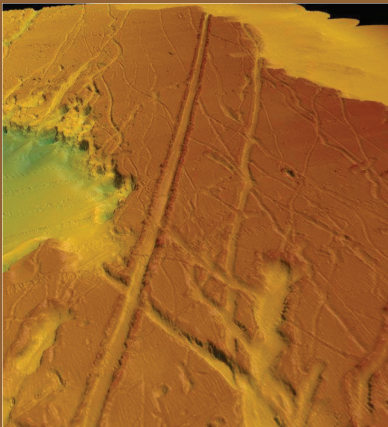


Left to right: JT Durica, Nick Conway, Dan Baker, Lili Clark

The team worked around the clock for three days, splitting the day into 12-hour shifts. At night, they conducted CHIRP (Compressed High Intensity Radiated Pulse) sub-bottom profiling to locate sediment-filled scours. During the day, they collected core samples using a gravity core dubbed “Big Bertha.” During this thorough research cruise, the team managed to successfully recover 27 cores, an amazing feat.

The cores were sent to a NSF sediment core repository at Oregon State University where they will be analyzed and archived for future studies. Foraminifera (tiny calcareous marine animals) picked from the cores can be used for radiocarbon dating and recording oxygen isotope ratios. These techniques will provide information as to when the carbon was first deposited, thus providing an approximate time of formation and sea level at that time.

Through participating in this cruise, the undergraduate and graduate students of SCE gained field experience using the latest geologic tools and software. Wheaton is grateful for the opportunity to “work with the cream of the crop of the [SCE].” In addition to field experience and making connections, undergraduates were able to earn course credit. Viso, department chair of coastal and marine systems science, pointed out the importance of hands-on learning experiences. “The real world has problems, [so a student must] learn how to adapt on the fly.”



Iceberg scours on North American continental shelf. Credit: Jenna Hill

Research opportunities like this one are currently being offered throughout the School of the Coastal Environment. According to Viso, “[SCE’s] mission is education, and research is a great way to make that happen.” In addition, Viso emphasized the importance of bringing opportunities to the next generation of scientists. Students can earn research opportunities like this one by performing well in the classroom and communicating with their professors on current developments in SCE.

## Joke’s on you...

Why do seagulls fly over the sea?

Because if they flew over the bay, they’d be bagels!



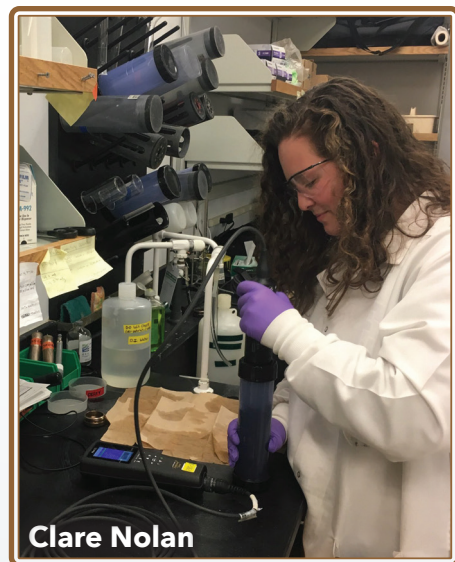
# Non-thesis Program

Fourteen years after the establishment of the master's degree program in coastal marine and wetland studies, the Department of Coastal and Marine Systems Science has unveiled a new curriculum to cater to prospective students: a non-thesis track option. As an alternative to the traditional research-driven degree, graduate students can acquire the necessary skills for the mastery of coastal marine and wetland studies without publishing a thesis.

To ensure similar skills are gained, non-thesis students have an expanded core curriculum, including scientific communication and quantitative skill-building courses. In this new option, supplemental coursework is required and a project(s)/internship can be completed instead of a thesis. These auxiliary projects can be related to research, educational outreach, environmental stewardship or an internship.

As an advanced degree has become more sought after for scientific careers both in the private and public sector, students may look for a path to gain the expertise required by a master's degree without a coinciding focus on skillsets particular to academia. Clare Nolan is a current non-thesis track master's student who is working to gain skills in lab and field techniques through her work on the Crabtree Microbial Source Tracking Project. During this project, she aims to determine the source of increased fecal bacteria in Crabtree Swamp, noted in previous sampling by CCU's Environmental Quality Lab to be a more polluted region of the Waccamaw watershed. "I came to grad school because I was job searching with my lone bachelor's degree in biology and found that almost every job I'd looked at required either two or more years of very specific work or a master's degree," she said. "Now at Coastal, it's almost like I am doing both! For me, a paper with my name on it isn't the main goal of grad school, it's learning the techniques I need to know to work the jobs I'm interested in having."

Richard Viso, Ph.D., advises prospective participants to "consider what type of skillset you need for [your desired career]" and to "make sure to understand the program and have a plan to complete it." For current and prospective students, he recommends searching for potential projects or internships available and getting involved by volunteering. He also stresses the importance of making yourself visible and of engaging with the professors in your field to stay knowledgeable about opportunities aligned with your career aspirations.



Clare Nolan



Richard Peterson, Ph.D.



Florida State graduate **Richard Peterson, Ph.D.**, has been a well-known face at Coastal Carolina University for a number of years. Specializing in chemical oceanography, Peterson does most of his current research on radio isotopes in deep water settings. With the help of graduate students Elana Ames and Matt Kurpiel, Peterson is using a suite of radium isotopes to not only date degraded oil parcels in the Gulf of Mexico but also to characterize the

Amazon River plume's mixing behavior. These radium isotopes are radioactive and have a half-life, allowing the team in the Gulf of Mexico to date a specific sample of oil back to a unique event, such as a leak or spill from a particular drill site. Using these tracers, it can be possible to locate where the greatest amount of oil leakage is coming from in these waters and aid in reducing and preventing future oil spills in these fragile environments. These same tracers used in the Amazon River project will determine the history and longevity of the water mass, helping to determine nitrogen availability and planktonic food web dynamics. Through grant funding from the Gulf of Mexico Research Initiative and the National Science Foundation, Peterson and his students are gaining a better understanding of these systems in order to support effective resource management.



“What are you going to do after you graduate?” We’re all too familiar with this loaded question. Thankfully for **Cara Schildknecht**, she had the answer right out of the gate: Waccamaw Riverkeeper. Schildknecht has wanted to be a Riverkeeper ever since she learned there was such a job. She previously completed her bachelor’s degree in environmental science at Shepherd University in West Virginia and served in the Peace Corps before she earned her master’s in coastal marine and wetland studies at CCU.

Schildknecht oversees the Winyah watershed, but mostly focuses on the Waccamaw River because of the increased development surrounding it, and helps protect the area against environmentally harmful activity. She is involved in community and educational outreach and events; serves as the official spokesperson for Winyah Rivers Foundation; and establishes and maintains cooperative relationships with other environmental groups, public officials and agencies. However, her favorite part of the job is assisting and supervising the volunteer water quality monitoring program. It is clear that Schildknecht fits perfectly in this occupation, utilizing her passion and drive to recruit motivated individuals and ultimately increase community participation to safeguard the Waccamaw.



**Cara Schildknecht**

As a zookeeper cares for her animals, Schildknecht strives to take the best care of the Waccamaw, but it was not a cakewalk to get where she is today. Her advice for current students looking to secure a job upon graduation is to become involved in internship, research and/or volunteering programs while in school or during the summers. As an undergraduate student, Schildknecht branched out by photographing fish and wildlife as well as volunteering on the Northern Marianas Islands to check on the re-establishment of bird populations. She attests that without these endeavors, she may not have been ready for her current job as the riverkeeper. The diverse skills she developed while working on these various programs in a professional environment were invaluable in her current position.

While at CCU, Schildknecht researched under the supervision of Susan Libes, Ph.D., completing her master’s thesis on microbial source tracking in the waters of Conway and Myrtle Beach. Her work not only involved experiments in the Environmental Quality Lab but also working with other students, faculty, and local and regional professionals. She believes her thesis work at Coastal allowed her to strongly develop the professional people and laboratory skills necessary for a position like the riverkeeper, which requires a well-rounded leader with a scientific background. Schildknecht is excited for what her job has in store for her as she continues networking and expanding her knowledge of the Waccamaw.



**Cara Schildknecht**

Schildknecht is always looking for volunteers to help her and the river! Contact her at the email below.  
**[riverkeeper@winyahivers.org](mailto:riverkeeper@winyahivers.org)**

# The Coastal Sea Turtle Club Supports our Flippery Friends

Coastal Carolina University is home to more than 160 student organizations. Of these, one organization highlights one of our most endearing ecological attractions along the coast: sea turtles. In the past decade, the Coastal Sea Turtle Club (CSTC) has climbed in popularity, reaching almost 100 members. The club organizes a variety of activities focused on the conservation and public education of sea turtles.

The Coastal Sea Turtle Club is highly active in its conservation efforts, taking on numerous projects to make our beaches and communities sea turtle friendly. During the fall, participants in the organization go to Waties Island, a private, undeveloped, barrier island on the northern tip of South Carolina, to join the Waties Island Turtle Monitors in turtle nest inventories.

Members determine the hatch success rate of each nest and help any lingering turtle hatchlings make it to the ocean. In addition, CSTC adopted a two-mile stretch of beach south of the SkyWheel where the organization holds weekend beach cleanups. Picking up litter from the beach not only maintains our coast's aesthetic beauty, but it reduces the risk of sea creatures becoming trapped, injured, sick or killed by improperly disposed trash, such as grocery bags or six-pack rings.

The CSTC takes care of the local pond turtles as well, installing a turtle feeder at CCU's Wall Pond to encourage students to use turtle-friendly food. In Spring 2018, the club will be competing with other organizations on campus in the Litter Letter Project. Groups from CCU will be assigned a letter-shaped garbage bin and compete to be the first one to fill it with trash collected throughout campus and the surrounding community. These efforts help our shelly comrades and show others how they can make the environment safer for wildlife.



A surprising and rare discovery was made during the 2017 monitoring season on Waties Island. "The finding of this hatchling confirms our suspicions. The dark color and white trim with the white underside was our confirmation. WE HAD OUR FIRST GREEN TURTLE NEST ON WATIES. YAHOOOOO!!!!!"  
*Credit: Waties Island Sea Turtle Monitors*

Community education is also a priority for the Coastal Sea Turtle Club. During the spring, the club focuses on fundraising and community education. Members visit local elementary and middle schools to teach the next generation of sea turtle enthusiasts about the creatures and how they can be proactive about sea turtle conservation. The club also brings awareness to the surrounding community by setting up a booth at the Relay for Life in April, inspiring individuals to do their part in keeping our community "shell-certified."

Members of this dedicated organization take opportunities to educate themselves as well. In the past, members have spent the night at the Ripley's Aquarium and the Georgia Aquarium. More enthusiastic members may choose to apply for a two-week excursion to Costa Rica where students collect data on locally nesting turtles.

Spearheading the various activities and initiatives of CSTC are the president, Erin Dean, and the vice president, Mario Costello. Dean grew up in Cleveland and always loved the ocean. She discovered her passion for turtles at a sea turtle camp while she was still in high school. Eventually, she wants to work at a sea turtle hospital and rehabilitation center. Costello is similarly passionate in marine science, hoping to find a career in marine sculpture to rebuild coral reefs by turning them into underwater museums. Dean, Costello, and the members of the Coastal Sea Turtle Club lead by example, showing us how we can preserve the ecological wealth of our community.

If you would like to get more involved with the Coastal Sea Turtle Club, visit the website at [coastalseaturtleclub.wordpress.com](http://coastalseaturtleclub.wordpress.com).



Coastal Sea Turtle Club, along with Waties Island sea turtle monitors, perform nest inventory. *Credit: Waties Island Sea Turtle Monitors*

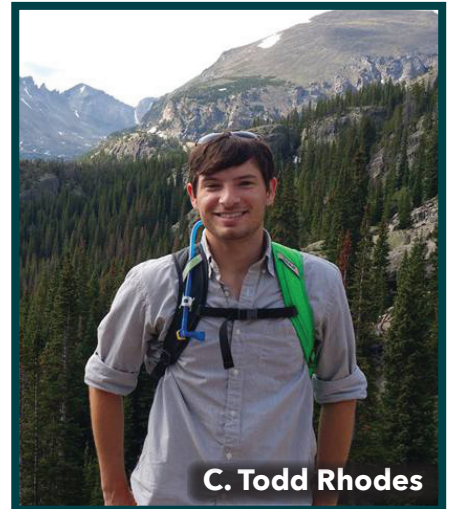


# A Note from the Editors

As a scientist, I find it motivating to see a group of faculty so dedicated to paving a way for the next generation of problem-solvers as they take on the local and global issues afflicting the coastal and marine systems. As the challenges humanity pursues grow in complexity, the days of the lone vigilante scientist draw to an end. Instead, teams take the forefront of scientific innovation, bringing out the strengths in each individual. This newsletter takes a fundamental step in fostering a sense of community within the School of the Coastal Environment. The school's contemporary approach to a specialized area from various backgrounds motivates collaboration and ingenuity in efforts to discover more about our environment and drive us forward, together.



C. Todd Rhodes, co-editor



Given this opportunity to try something new, I'm proud to present the first newsletter of the School of the Coastal Environment along with Todd Rhodes, Karen Fuss and Richard Viso. It has been quite a learning curve full of new professional experiences, and I'm looking forward to what ripple effect this newsletter will have on readers and for the development and growth of this project as the years progress. It's been an honor to be a part of The Coastal Current's debut, and I'm curious as to the inspiring directions it takes in the future.



Clare J. Nolan, co-editor



**A SPECIAL THANKS to Karen Fuss and Richard Viso. The Coastal Current would not have been possible without their vision and guidance.**



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# COASTAL CAROLINA

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School of the Coastal Environment

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Find us online: [coastal.edu/sce/coastalcurrent](http://coastal.edu/sce/coastalcurrent)

School of the Coastal Environment

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