



COASTAL SCIENCE SYMPOSIUM 2018 PROCEEDINGS

Hosted by the College of Coastal Georgia

9 November 2018
9:00 am – Noon
Stembler Theatre, Campus Center

WELCOME

Welcome to Coastal Science Symposium 2018 at the College of Coastal Georgia, where students, faculty, scientists, natural resource managers, and community members come together to explore coastal and marine science research and applications to society. This year’s program features guest speakers who span the natural and human dimensions of coastal science, an ensuing panel discussion, poster presentations of undergraduate research and service-learning, and an information fair with community partners in coastal science and conservation. We are also celebrating the launch of the College’s new Bachelor of Science degree in Environmental Science, which complements the Biological Sciences – Coastal Ecology program to provide students with a range of options for scientific discovery and professional development on the coast.

Thank you for participating and for supporting the College of Coastal Georgia and the Georgia coast!

Symposium Organizers: Tate Holbrook, Elizabeth Brabson, Deborah Browning, Kelly Clark, James Deemy, Heather Farley, Janet Gannon, Holly Nance, Traesha Robertson, and David Stasek

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SYMPOSIUM PROGRAM

Campus Center Lobby

8:15 Registration

Stempler Theatre

9:00 Welcome

Tate Holbrook, Associate Professor of Biology and Organizing Committee Chair

Lance Carluccio, Interim Provost and Vice President for Academic Affairs

Andrea Wallace, Interim Dean, School of Arts and Sciences

9:20 Enhancing Resilience through Coastal Restoration

Rachel Gittman, Assistant Professor, Department of Biology and Institute for Coastal Science and Policy, East Carolina University

10:00 Cooperative Research at SSU, the University by the Sea

Dionne Hoskins-Brown, Fishery Biologist, National Oceanic and Atmospheric Administration (NOAA) Fisheries and Director, NOAA-Sponsored Programs, Savannah State University

10:40 Panel Discussion

Campus Center Lobby

11:00 Poster Presentations and Information Fair

ORAL PRESENTATION ABSTRACTS

Enhancing Resilience through Coastal Restoration

Rachel Gittman¹, Devon Eulie², Brandon Puckett³, Mariko Polk², Carter Smith⁴, & Emory Wellman¹

¹ East Carolina University, Department of Biology and Coastal Studies Institute;

² University of North Carolina Wilmington, Department of Environmental Studies;

³ North Carolina Coastal Reserve and National Estuarine Research Reserve, North Carolina Division of Coastal Management, Department of Environmental Quality;

⁴ University of North Carolina at Chapel Hill, Institute of Marine Sciences

Coastal ecosystems provide numerous services to people, including productive fisheries, storm protection, and recreational opportunities, but are being degraded at alarming rates globally. One goal of our research is to better understand how to restore critical habitats within coastal ecosystems, such as oyster reefs and salt marshes, to increase ecological and societal resilience to storms and other environmental stressors. Our research group has been studying how one type of coastal restoration, living shorelines, perform during hurricanes, as compared to traditional, hard shoreline protection approaches in North Carolina. Results from multiple surveys pre- and post-hurricanes suggest that living shorelines are more resilient than hard shore structures. However, we have also found that not all living shoreline designs are equally resilient to storm events. Therefore, we are now comparing the ability of living shoreline substrates—bags and Oyster Catcher™—to stabilize eroding salt marsh and promote self-sustaining oyster reef communities. We have documented performance during two major storms, Hurricane Florence and Tropical Storm Michael, and preliminary results suggest that storm conditions and substrate type can affect the resilience of living shorelines. Future work will include continued monitoring of living shorelines to determine long-term (decadal) resilience and additional testing of living shoreline designs and materials.

Cooperative Research at SSU, the University by the Sea

Dionne Hoskins-Brown, National Oceanic and Atmospheric Administration and Savannah State University

NOAA's Southeast Fisheries Science Center has provided substantial guidance and support to the marine science degree programs at Savannah State University (SSU) for almost 30 years, beginning in the early 1970's when the university first began offering marine biology courses. Since 2000 NOAA Fisheries has supported cooperative research among the faculty at SSU through a formalized partnership. The addition of the Master of Science in Marine Sciences expanded the research and education opportunities for students in the region. Dr. Hoskins-Brown is the director of the NOAA program at SSU. She will describe the major research areas of the M.S. program and describe the progress the program has made in research and education on the eve of its 20-year anniversary. She will include recent oyster monitoring and emerging human dimensions work highlighting Gullah Geechee communities.

POSTER PRESENTATION ABSTRACTS

Living Shoreline Monitoring at Cannon's Point Preserve

Kristina Ashe, Mason Forsyth, Cole Wiggins, Cole Wilder, & C. Tate Holbrook, College of Coastal Georgia, Department of Natural Sciences

The main goal of conservation biology is to prevent the loss of biological diversity. In BIOL 4020 Conservation Biology, we apply conservation biology at Cannon's Point Preserve (CPP), a 600-acre nature preserve on the north end of St. Simons Island, GA that is managed by the St. Simons Land Trust. A living shoreline was constructed along an erosional section of Lawrence Creek at CPP in 2015. The living shoreline is an alternative erosion control structure that aims to stabilize the creek bank without disrupting the natural salt marsh–upland interface the way a bulkhead would. Our research objectives were to continue a biological monitoring program and evaluate the ecological effects of the living shoreline at CPP. Data was collected from 2014, before the living shoreline was constructed, through 2018, three years post-construction. Eight transects were established perpendicular to the shoreline. Along each transect, we sampled the species diversity and density of the flora and fauna through the intertidal and supratidal zones, paying close attention to recruitment levels of the eastern oyster (*Crassostrea virginica*) and smooth cordgrass (*Spartina alterniflora*). Compared to the pre-construction baseline data, the living shoreline has shown an increase in species diversity and in population density of the target species, which provide bank stabilization and ecosystem services including habitat and nutrient cycling. Our findings suggest that the living shoreline has had a positive overall impact on the salt marsh ecosystem, while effectively stabilizing the bank of Lawrence Creek.

Internship in Conservation, Jekyll Island

Maitland Bass, College of Coastal Georgia, Department of Natural Sciences

I completed a service-learning internship with the Conservation Department on Jekyll Island. Jekyll Island Conservation's mission is to preserve and enhance the island's natural beauty and biodiversity, while providing the public with educational and recreational opportunities. I was dedicated to three projects. First, I used game cameras to monitor the Common Nighthawk, including its nesting ecology, hatchling success, and local threats. My next project was to identify the different fern species on Jekyll and make a fern field guide. My last project was to do point count surveys at seven different locations on the island for Painted Buntings. I was also able to help with AmeriCorps projects such as Eastern Diamondback Rattlesnake tracking with radio telemetry and mark-and-recapture for the American Alligator. Each of these projects are essential in helping with wildlife management to learn more and protect species. Before doing this internship, I was stuck on wanting to become a marine biologist, but after this I believe working in wildlife management is what I want to do. This internship has taught me team work, time management, independence, self-confidence, and many more things.

Maritime Forest Restoration at Cannon's Point Preserve

Maitland Bass¹, Clayton Davis¹, Tiffany Reynolds¹, Emily C. Thyroff², & C. Tate Holbrook¹

¹College of Coastal Georgia, Department of Natural Sciences; ²Purdue University, Department of Forestry and Natural Resources

Our Conservation Biology class assisted the St. Simons Land Trust and academic partners with a maritime forest restoration project at Cannon's Point Preserve (CPP). Maritime forests are a key component of coastal ecosystems in the southeastern United States. They have been extensively destroyed, fragmented, and degraded for agriculture, lumber, and development. Live oak (*Quercus virginiana*) is a dominant species in maritime forests that provides habitat and food for wildlife. The overall goal of the project at CPP is to determine the best

management practices for regenerating live oak in areas that were previously converted to pine plantations. Phase 1 of the project showed that herbivore exclusion is key to survivability of seedlings. We contributed to Phase 2, an experiment to evaluate the relative influence of canopy or overstory thinning (2016 clearcut, heavy thin, light thin, no thin) and competing vegetation control (weeding) on live oak regeneration success. We conducted vegetation surveys in which we measured percent cover and height of competing vegetation around planted live oaks in each treatment. We also assisted with vegetation removal in assigned plots. Preliminary results suggest that overstory thinning promotes the growth of competing plants, although live oak seedlings may also benefit from the increased light availability. Selective weeding appears to be most effective in heavily-thinned to clearcut areas. This research will inform maritime forest restoration plans at Cannon's Point Preserve and other coastal locations that were historically converted to lumber pine stands.

Ant Diversity along the Primary Dunes of Jekyll Island

Ashlyn R. Bone¹, Katie M. Brill¹, John W. Mahas^{1,2}, & C. Tate Holbrook¹

¹ College of Coastal Georgia, Department of Natural Sciences; ² current: Auburn University, Department of Entomology and Plant Pathology

Solenopsis invicta, or the red imported fire ant (RIFA), is one of the most successful invasive species found in the southeastern United States. Previous research has shown that RIFA is an effective predator of sea turtle eggs and hatchlings, including loggerhead turtles (*Caretta caretta*) nesting on Jekyll Island, GA. The aim of this study was to conduct a preliminary survey of the dominant ant species occurring along the primary dunes of Jekyll Island, and to analyze the distribution of RIFA along those dunes. We tested two hypotheses: (1) RIFA is more likely to occur in disturbed or human impacted areas than in areas with little human disturbance, and (2) within a local area, RIFA is most abundant near public access points. Four sites were sampled, two considered to be “disturbed” and two considered to be “undisturbed”. Nine ant species from three different subfamilies were collected across the four sites. However, RIFA was relatively rare in our samples, and we were unable to detect any association with human disturbance or access. This work provides important insights into the ant communities of barrier island dunes and the threat of predatory fire ants to sea turtles and other shore nesting species.

The Tawny Crazy Ant (*Nylanderia fulva*) in Southeast Georgia

Kaitlyn M. Brill & C. Tate Holbrook, College of Coastal Georgia, Department of Natural Sciences

Nylanderia fulva, also known as the tawny crazy ant (TCA), is a newly invasive species introduced to the United States from Argentina. Its common name refers to the “crazy”, erratic movements of workers, which usually do not follow orderly foraging trails. TCA can nest in and attack electrical appliances, causing short circuiting and power outages. They have also been found to disperse native insect populations at areas where they are established. Queens spread to new territories primarily by means of human transportation such as cars, trucks, and boats. Our research initially aimed to map the current distribution of TCA in southeast Georgia and identify entry points by surveying for established colonies along Interstate-95. We baited for foraging workers and conducted visual surveys around truck stops and other sites at northbound exits on I-95 in Glynn and Camden Counties. Additional sites of TCA infestation were detected from conversation with informed persons as well as historical data. We confirmed only one currently infested site, at Exit 26, where colonies were found at commercial and residential properties near the interstate. We plan to conduct additional surveys to determine how far from this origin point TCA has dispersed. Previously reported TCA infestations have apparently been controlled. We will present resources for the identification and control of TCA, and propose future research directions.

Wildlife Conservation Internship – White Oak Conservation

Sarah R. Buckley, College of Coastal Georgia, Department of Natural Sciences

During my internship, I worked with White Oak Conservation, a conservation facility in Yulee, FL whose mission is to “save endangered wildlife and habitats through sustainable conservation breeding, education and responsible land stewardship.” During my time at White Oak, I worked side-by-side with our wildlife specialists gaining valuable hands-on experience maintaining and caring for 17 different species, such as Giraffes, Rhinos, Okapi, and Grevy’s Zebra. My duties included feeding, cleaning, observing behaviors, animal handling, diet preparation, proper maintenance of enclosures, veterinary care, and neonatal care. For our internships, we had three service-learning outcomes. The first was civic learning. The need for my internship was obvious – we’re protecting and breeding endangered animals in order to help preserve species. The second outcome is academic enhancement. Conservation Biology originally introduced me to White Oak and by interning there I was able to expand and go deeper into what I learned in that class. The last outcome is personal growth. I learned so much in this internship. Not just with working with new animals that I had never worked with before and gaining knowledge with them, but also by working in a new environment with different challenges. This helped me learn about more about my strengths and weaknesses that I can then use to improve on in the future as I move on in my education and career.

Detecting the Invasive Lionfish (*Pterois volitans* and *Pterois miles*) in Georgia Estuaries with eDNA

Amanda Crane & Holly Nance, College of Coastal Georgia, Department of Natural Sciences

Environmental DNA (eDNA) is DNA that has been left behind by organisms in microscopic particles that can be collected, isolated, and amplified. eDNA is an important tool for researchers to monitor the distribution of threatened or invasive organisms. Our research focuses on lionfish (*Pterois volitans* and *Pterois miles*), an invasive species that has spread from the Caribbean up along the Atlantic coast of the United States, posing a large problem for the entire ecosystem. Lionfish have very few natural predators in this region and are a threat to native species of economic importance, such as snapper and grouper. While lionfish have been documented in Florida estuaries and off the Georgia coast in Gray’s Reef National Marine Sanctuary, it remains unknown if they are in our local estuaries. We are currently optimizing a protocol to amplify a 680 BP amplicon using published primers for lionfish with traditional polymerase chain reaction (PCR) and known samples of lionfish filet. Once we have optimized the thermal cycling protocol, we will further optimize using quantitative PCR (qPCR), as this method will be more sensitive to small concentrations of eDNA we anticipate in our water samples. Once we observed consistent results using qPCR, we can then move forward in our research collecting water samples, filtering, and extracting DNA, and applying qPCR as a diagnostic tool to test for the presence or absence of this invasive fish.

Monitoring Laurel Wilt in Redbay Trees at Cannon’s Point Preserve

Will Daniell, Alex James, Darrah Mitchell, Katie Brill, James B. Deemy, & C. Tate Holbrook, College of Coastal Georgia, Department of Natural Sciences

Laurel wilt is a destructive vascular disease known to cause widespread mortality of tree species from the family Lauraceae, particularly redbay (*Persea borbonia*), in the southeastern United States. The disease is caused by an invasive species of beetle known as the redbay ambrosia beetle (*Xyleborus glabratus*). The redbay ambrosia beetle hosts a symbiotic fungus (*Raffaelea lauricola*) that is the source of the infection, triggering a plant defense response that blocks water transport, causing systemic wilting of leaves and then death. As part of a service-learning project in BIOL 4020 Conservation Biology, we monitored a redbay population at Cannon’s Point Preserve, St. Simons Island, GA. Remarkably, the population contains numerous mature redbay trees that survived the initial outbreak of laurel wilt in the mid-2000s. We located and mapped overstory redbay trees (diameter at breast height ≥ 10 cm), measured their size, and noted reproductive state, percentage of foliar wilt,

and other signs of redbay ambrosia beetle infestation. Unfortunately, between 2016 and 2018, seven out of 26 previously healthy trees acquired laurel wilt. Five of the seven infected trees had 100% wilt and were presumed dead. There was no relationship between tree size and the presence of laurel wilt. Spatial analysis showed no clustering among the diseased trees. The increase in susceptibility of redbay trees to laurel wilt could be a result of immune stress caused by recent hurricane activity. Future research and management should include continued monitoring of surviving trees, screening for genetic resistance, and removal of diseased trees.

Service-Learning Internship in Coastal Ecology at Coastal Resources Division

Clayton Davis, College of Coastal Georgia, Department of Natural Sciences

During the summer of 2018, I participated in a service-learning internship at the Coastal Resources Division (CRD) of the Department of Natural Resources. My goal was to shadow and assist in the various responsibilities that the CRD performs in the management and conservation of the Georgia coast. The bulk of my time was spent with the Coastal Zone Management section as they have the widest ranging responsibilities, including water quality monitoring, permitting and enforcement, public education, and research coordination. The Marine Fisheries section's priorities lie in management of recreational and commercial fisheries and collecting data on fish populations. I was able to contribute to every one of these missions to some extent. I was also able to spend a week with the Wildlife Resources Division Wildlife Conservation section and help with coastal wildlife surveying. This wide purview of the CRD provided opportunities to better understand how resources are managed on the coast and the complex relationships between federal and local government, along with partner organizations and the public. My key takeaway from my time with CRD is that they are acting on the public's behalf as stewards of our coast.

Epigenetic Modifications of *Fundulus heteroclitus*

Kelsey Dunman & Holly Nance, College of Coastal Georgia, Department of Natural Sciences

Pollution causes negative impacts on the environment and the organisms which inhabit it. However, some organisms are able to thrive in these polluted areas. This study focuses on how this is possible through epigenetic modifications. *Fundulus heteroclitus* is a species of fish that may have evolved genetic resistance to toxic effects, due to altered AHR expression that results from hypermethylation of DNA. Specifically, this occurs in the promoter region of these genes. The aryl hydrocarbon receptor is a ligand-activated transcription factor in the regulation of biological responses to planar hydrocarbons (PAHs). This receptor regulates that participate in the conversion of PAHs to more polar and water-soluble metabolites, which can further increase cell toxicity. However, by silencing the AHR gene through an addition of a methyl group, there is an overall down-regulation of the AHR signaling pathway, and therefore, a prevention of toxic substance breakdown. We are using qPCR to assess methylation rates in the promoter region of AHR genes in *F. heteroclitus* collected from local EPA Superfund sites to determine whether epigenetic modifications may enable these fish to survive in the presence of toxins, such as toxaphene. Currently, we are optimizing our amplification protocol to ensure our results are repeatable.

Well, is the Water Clean? Water Quality Monitoring Internship with the Satilla Riverkeeper

Tyler Fitzgerald, College of Coastal Georgia, Department of Natural Sciences

Over the past nine months I have had the awesome experience of interning for the Satilla Riverkeeper, Laura Early. If there is one thing that I have learned through this whole experience it is that the Riverkeeper “wears many hats” and I thoroughly enjoyed getting to try some of them on. Largely, my role was Water Quality Monitoring Assistant, which consisted of primarily bi-weekly and monthly testing and monitoring of chemical and bacterial parameters at five sites along the Satilla River and its tributaries as well as detecting the presence and prevalence of microplastic at Turtle River Park. Unfortunately, the full results of the microplastic sampling are still unavailable. At each site, I did two very important things: 1) I assessed and monitored the health of our local waters, and 2) I assessed the human health risk with contact of the associated water during the most crucial time of the year. I did this by tracking and logging several physical, chemical, and bacterial parameters such as temperature, dissolved oxygen, conductivity, PH, and bacterial coliform units of *E. coli*. To see my full results, safety notifications, and much more, you can go to <https://adoptastream.georgia.gov/> which is also relayed to www.theswimguide.org, a live water quality reporting webpage free to the public.

Sea Turtle Research Internship

Jordan Hamby, College of Coastal Georgia, Department of Natural Sciences

This past summer I worked as a research intern with the Georgia Sea Turtle Center (GSTC) focusing mainly on the endangered loggerhead sea turtle. I helped with identification and tagging of loggerhead females and with the management and excavation of loggerhead nests on Jekyll Island. This internship allowed me to gain experience collecting data, observing wild creatures, and working in the field. This experience was important, not just for me but for the community. This internship allowed me to gain experience with collecting data, observing wild creatures, and working in the field. This experience was important, not just for me but for the community. By educating the people that I encountered while conducting my patrols, I played a role in getting the word out about conservation of these creatures and even inspiring kids to become the next generation of scientists. During this internship, I implemented much of what I have learned in classes, from data collection techniques to how to teach people about science. The data I collected will be used by GSTC and the Georgia Department of Natural Resources to create new policies and strategies for sea turtle research and protection in the future. This internship taught me how to be a scientist, not just the glamorous, “you’re the people that save turtles,” part but also the dirty, often stinky, part. The experiences gained from this summer reaffirmed how much I wanted to be a scientist and how much I love educating people about things I love.

Bird Usage of Nine-banded Armadillo Burrows on Little St. Simons Island, GA

R. Alex James¹, Zachary P. Butler², & C. Tate Holbrook¹

¹College of Coastal Georgia, Department of Natural Sciences; ²University of Georgia, Odum School of Ecology

The nine-banded armadillo (NBA; *Dasypus novemcinctus*) is a recent arrival to coastal Georgia and the ecological impacts of its presence are not well known. Previous research on Little St. Simons Island (LSSI) discovered that armadillo burrows are visited by many different animal species, including various birds. This study will examine the bird usage of NBA burrows and the behaviors performed by birds at the burrow sites. We have established three study sites on LSSI that differ in habitat (sand dune complex, coastal grassland, and maritime forest). At each site, six armadillo burrows are being monitored 24/7 using motion-sensor field cameras. Still images and videos will be used to determine: (1) which species of birds are using the burrows, (2) when do birds use the burrows, (3) how do birds behave at the burrow entrance, and (4) how does bird usage of the burrows differ between habitats. Preliminary results indicate at least seven bird species visiting NBA burrows across the three

habitats. Knowledge of bird usage of NBA burrows is critical to understanding the ecological significance of the NBA in coastal Georgia. This study will help to inform and guide future conservation and management practices involving the NBA.

Does *Karenia brevis* Affect the Appetite of a Common Sea Anemone?

Darrah Mitchell¹ & Emily R. Hall²

¹College of Coastal Georgia, Department of Natural Sciences; ²Mote Marine Laboratory & Aquarium

Aiptasia spp. are a type of sea anemone in the phylum Cnidaria, like corals. They grow quickly and abundantly in marine habitats worldwide. They are a symbiotic organism and appear to be resilient to extreme environmental conditions. The OASys Lab at Mote Marine Laboratory is currently studying how *Aiptasia* respond to elevated temperatures and reduced pH levels. *Karenia brevis* is a harmful algae that causes red tide blooms when given the right conditions. There are many harmful effects associated with this algae including severe illness and sometimes even mortality of marine and coastal organisms like fish and small mammals. It can also cause respiratory illness in humans. *Aiptasia* and *K. brevis* are both found in Florida coastal environments, yet to our knowledge, there has not been any studies looking at the effects of *K. brevis* on *Aiptasia*. *Karenia brevis* has been proven to kill off many species of marine life. Therefore, we were interested in understanding if *K. brevis* had similar effects on *Aiptasia*. Specifically, their feeding and physiology patterns. Using *Artemia* we observed when the *Aiptasia* were feed and how much they ate over ten days. We found that feeding patterns generally decreased, photosynthesis generally declined and respiration rates were mostly normal. Showing that the presence of *Karenia* decreases *Aiptasia* health and the higher the concentration the worse the effect.

Evaluation of a New Turtle Excluder Device Design for Use in the Cannonball Jellyfish Fishery Operating in Georgia's Territorial Waters

David J. Stasek¹, Jeffrey E. Tailer¹, James Page², Patrick J. Geer², & Bryan A. Fluech³

¹College of Coastal Georgia, Department of Natural Sciences; ²Georgia Department of Natural Resources, Coastal Resources Division; ³University of Georgia Marine Extension & Georgia Sea Grant

The cannonball jellyfish (*Stomolophus meleagris*) is a common Cnidarian species commercially harvested in state and federal waters adjacent to Georgia. In 2013, the cannonball jellyfish fishery transitioned from an experimental fishery to an official state fishery governed by the rules and regulations established in Georgia law. Requirements included the mandated use of a turtle excluder device (TED) approved by the National Marine Fisheries Service (NMFS) for use in state waters. Several fishers indicated that the approved TEDs negatively impacted catches due to larger jellyfish being unable to pass through the TED bar spacing. In an effort to address this issue, we developed and evaluated a new TED design to potentially increase cannonball jellyfish retention in nets while still promoting sea turtle exclusion. We first conducted 35 paired tows to compare catch between a net with no TED (naked net) and a net with the NMFS-certified TED with four-inch vertical bar spacing. We then conducted 21 paired tows with a net with no TED and a net equipped with an experimental 8x8 inch gridded TED design. There was a significant difference in catch between nets with the NMFS-certified TED and naked nets with the net with the TED catching 23.6% less per haul. There was no significant difference in catch size in the paired trawls with the experimental TED and the naked net. Given the results of this study, it is hoped NMFS will consider this new TED design for use in the cannonball jellyfish fishery.

White-tailed Deer (*Odocoileus virginianus*) Population Surveys at Cannon's Point Preserve

Calvin Thigpen¹, Stephanie Knox², & C. Tate Holbrook¹

¹College of Coastal Georgia, Department of Natural Sciences; ²St. Simons Land Trust

Knowing white-tailed deer (*Odocoileus virginianus*) population size and density is very important for the management of Cannon's Point Preserve (CPP), St. Simons Island, GA. White-tailed deer are large herbivores that can have negative ecological impacts when they occur at high densities, such as damaging native plants and causing an increase in tick populations. To minimize the effect of deer on the natural environment, there must be proper management strategies, which require accurate estimates of population size and other parameters. Three survey methods – spotlight survey, camera trap survey, and browse survey – were used to estimate white-tailed deer population size, density, sex ratio, and recruitment at CPP. New spotlight and browse survey results were compared to previous data to determine any trends over time. The camera trap survey had not been used before at CPP. The three surveys produced slightly different estimates, but they all indicated that the white-tailed deer population is too large for the area of habitat at CPP. Estimates of sex ratio and recruitment may have differed due to the timing of the surveys or their locations. Each individual survey method has strengths and weaknesses, but using them in combination and repeating them over time gives a more accurate representation. Our findings will help guide future survey methods and management strategies to maintain a healthy deer population and protect plants from overgrazing.

Service-Learning Internship: Education at Tidelands Nature Center

Cole Wilder, College of Coastal Georgia, Department of Natural Sciences

During the summer of 2018, I participated in an internship at 4-H Tidelands Nature Center on Jekyll Island. As an intern my focus was to help achieve the goals of Tidelands, which are to educate the public, both local and visiting, on the wildlife of Jekyll Island and their habitats. The other goal is to care for the captive animals on display at the center. I was put in charge of preparing and teaching the summer feeding program, as well as help with any other educational programs during the week. I also regularly answered questions asked by visitors at the center. I prepared food for the animals and helped with any maintenance and cleaning that needed to be done to the exhibits. Interning at Tidelands Nature Center helped me grow my skills in relaying scientific information to a variety of different audiences. It also gave me the insight into the values and importance of teaching itself.

Monitoring Water Quality with the Georgia Environmental Protection Division

Summer Wright, College of Coastal Georgia, Department of Natural Sciences

The Environmental Protection Division of the Georgia Department of Natural Resources (DNR) seeks to protect and restore the environment through implementing laws, conducting research and field work, and implementing policies. I completed a service-learning internship with the Watershed Protection Branch of the EPD. They manage water resources through conducting field work, collecting data, and distributing permits to facilities that discharge wastewater in order to prevent harmful contaminants and pollution in Georgia's waterways. They create models of water quality monitoring and waterways. I experienced the work of an Environmental Technician. I got to go out on the water collecting water samples and data from various sites in estuaries, sounds, and rivers that were only accessible through boat. I experienced wading through creeks in order to collect samples that contained various microbial lifeforms. The variables monitored are vital to a healthy water ecosystem. They are kept closely monitored in order to ensure the safety of humans, aquatic life, and the local environment. I got to work up close with different types of water quality, from poor to healthy. This internship expanded my knowledge of the scientific process that is involved in creating and maintaining a healthy environment for waterways.

EXHIBITORS

College of Coastal Georgia Center for Service-Learning
Georgia 4-H at Camp Jekyll/Tidelands Nature Center
Georgia Department of Natural Resources Coastal Resources Division
Glynn Environmental Coalition
Georgia Sea Turtle Center
Jekyll Island Authority Conservation Department
Keep Golden Isles Beautiful
Okefenokee National Wildlife Refuge
One Hundred Miles
The Dolphin Project
The Nature Conservancy
University of Georgia Applied Wildlife Lab
University of Georgia Marine Extension and Georgia Sea Grant
University of Georgia Marine Institute on Sapelo Island

SPECIAL THANKS TO:

Lance Carluccio
Kalene Chasteen
Cody Cocchi
Michelle Johnston
Tiffany King
Linda Sackett
Andrea Wallace
Christy Lynn Wilson

Aladdin Food Management Services
College of Coastal Georgia Police
Center for Service-Learning
Facilities and Plant Operations Team
Student Life Team

Guest Speakers
Community Partners
Student, Faculty, and Staff Participants and Volunteers

BROUGHT TO YOU BY:

Department of Natural Sciences, School of Arts and Sciences, College of Coastal Georgia

Symposium Organizers: Tate Holbrook, Elizabeth Brabson, Deborah Browning, Kelly Clark, James Deemy, Heather Farley, Janet Gannon, Holly Nance, Traesha Robertson, and David Stasek