2021 CCU Undergraduate Research Competition Abstracts

(Alphabetical by Presenter)

Effect of Aerobic Exercise with Blood Flow Restriction on Substrate Utilization and Energy Expenditure (Oral Presentation)

Nathen Andrews (Exercise and Sport Science)
Faculty Research Mentor: Jakob Lauver and Justin Guilkey, Kinesiology

The purpose of this study was to examine the effects of intermittent blood flow restriction (BFR) compared to low- (LIIE) and high-intensity interval exercise (HIIE) on energy expenditure (EE) and substrate utilization. Participants randomly performed each interval exercise protocol, and then rested for a three-hour period, in which EE and substrate utilization were measured. Total EE was different between BFR (321.6 Â± 30.1 kcals), HIIE (254.5 Â± 33.5 kcals), and LIIE (287.1 Â± 25.5 kcals). Fat oxidation (FatOx) in BFR (1hr = 0.14 Â± 0.01 g / min, 3hr = 0.11 Â± 0.01 g / min) was greater than LIIE (1hr = 0.08 Â± 0.02 g / min, 3hr = 0.9 Â± 0.02 g / min). This study suggests that the addition of intermittent BFR to LIIE may result in greater EE but similar substrate utilization compared to HIIE, albeit at a lower work rate.

Behavior Management Systems in the Classroom: Which Systems are used most often? (Oral Presentation)

Molly Antkowiak, (Elementary Education)
Faculty Research Mentor: Richard Costner, Foundations, Curriculum and Instruction

In many classrooms, the student's behaviors are controlled by a behavior management system. The type of system is chosen by the teacher based on their classroom. Different classrooms would be studied to figure out which systems are used the most and if the type of system chosen is different due to the number of students in the classroom, the amount of degrees the teacher has, the ratio of boys and girls and the grade level. This data will be collected by survey that goes out to each teacher participating. This survey will analysis the teacher's behavioral management system that they use in the classroom. The study will focus on PBIS. Method for providing social, emotional, and behavioral services to children within schools. At its root, PBIS is a multi-tiered system of interventions." (Krach)

Lichen Delimitation within the Collematacaea Family (Poster Presentation)

Catherine Austin (Biology)
Faculty Research Mentor: Megan Cevasco, Biology

Lichens are composed of fungal and algal or cyanobacterial components that participate in a mutualistic relationship. Recently, lichen-associated bacterial microbiomes have also been discovered to play a role in this relationship. Gathering information concerning lichen evolutionary relationships can bring more clarity to how lichens have evolved to be better equipped to house these bacterial communities. Specifically, this study aims to understand the evolutionary relationship between lichen species within different genera of the Collemataceae family. Broadening the taxa being studied from the Kosuthova et al. 2020 study to 20 total lichen species within the Collematacaea family, allows for a phylogenetic approach of analysis of the mitochondrial small subunit ribosomal RNA (mtSSU) gene to provide additional clarity to lichen species delimitation. Phylogenetic hypotheses reflecting the additional taxa are analyzed and compared to the trees presented in the Kosuthova et al. 2020 study to generate this clarity.

The Inclusivity of Emotional Abuse Definitions and Interest Groups (Oral Presentation)

Alexandria Banning (Political Science)
2021 Undergraduate Research Competition

Faculty Research Mentor: Adam Chamberlain, Politics
Cases of emotional abuse involving children have been previously associated with long lasting physical and psychological issues among those who experience it. Previous research has linked the significant underreporting of emotional abuse cases with the use of vague and unclear definitions of emotional abuse as it involves minors. Creating a concise and inclusive definition has proven to be difficult because of a lack in physical evidence to support claims, thus each of the 50 US states have a different definition for what constitutes emotional abuse. Yet, why do definitions vary in the first place? Here, I hypothesize that states with more interest groups focused on child welfare will lead to clearer, more strict definitions of emotional abuse. Using counts of these interest groups in each of the 50 states, I find no statistical connection between the number of interest groups in a state and a more inclusive legal definition of child emotional abuse. Other factors, such as state income and political ideology, also cannot explain these differences. Given the results of the research, questions of whether a federal definition would be necessary are proposed, but left unexplored for future research.
Keywords: emotional abuse, interest groups, income, social policy, political ideology, correlation coefficient

Monitoring TDS and Conductivity at the Murrells Inlet Oyster Landing (Poster Presentation)
Nicholas Baxley (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Total Dissolved Solids or TDS is a measurement of dissolved materials in water. Conductivity is a measure of water's ability to conduct electric current. TDS and conductivity measurements are dependent on the drainage in that area and the recent weather. 293 TDS and conductivity samples were taken using a portable Hanna HI 9828 meter at the Murrells Inlet Oyster Landing in South Carolina between May 2008 and Feb 2021. The mean value of Conductivity during this time was 51,904 uS/cm and the mean value of the TDS is 29,598mg/L.

Homology of a Maturase to the Heart of the Nuclear Spliceosome (Oral Presentation)
Isabella Becker (Biology)
Faculty Research Mentor: Michelle Barthet, Biology
Structural and biochemical evidence links group II introns as evolutionary precursors of nuclear introns. The spliceosome binds and excises nuclear introns. Maturases are prokaryotic enzymes that aid group II intron excision. The evolutionary ties between group II introns and nuclear introns suggest a possible link between maturases and the nuclear spliceosome. Structural analysis of Prp8, a core enzyme of the nuclear spliceosome has demonstrated this link and revealed similarity to prokaryotic maturases. Maturase K (MatK) is a chloroplast group II intron maturase. Unlike prokaryotic maturases, MatK binds to multiple intron substrates suggesting possible evolution akin to the nuclear spliceosome machinery. In the chloroplasts, MatK is responsible for the splicing of 7 plastid-encoded introns. We investigated protein interactions of the MatK maturase using co-immunoprecipitation. We determined similarities to proteins that interact with nuclear Prp8 ribonucleoprotein complex. This data supports MatK as a model of early evolution of the nuclear spliceosome.

Watching for Nuclear Proliferation with Neutrinos (Poster Presentation)
Lee Beeson (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Nuclear weapons are a constant threat. They give a country the ability to wipe out entire cities and make the area unlivable. Which is why it is necessary to watch for their creation. This paper will show how nuclear weapon proliferation by states can be detected using neutrinos. Neutrinos are subatomic

particles that are released from the decay of radioactive isotopes and rarely react to matter. To prove that neutrinos can do this, an experiment of the radioactive isotope cobalt-60 and a sodium-iodine scintillator, are used. During the experiment environment factors were recorded every 10 minutes and the data logger recorded neutrino count every 30 minutes. The results of the experiment will show how neutrinos coming from the isotope, show how it is decaying and even give us a base of what environmental factors may lead to change in its decay.

Using Modern Gorilla gorilla to Understand *Paranthropus Boisei* (Oral Presentation)
Glorianna Belyski, (Anthropology and Geography)
Faculty Research Mentor: Carolyn Dillian, Anthropology & Geography
Can we use modern Gorilla gorilla as a model to understand the extinct hominin species *Paranthropus boisei*? This project uses paleoanthropology and landscape reconstruction to try to develop common ground between these species, specifically to understand their living environments and diet. Measurements of the skulls of both species also may show morphological similarities between the species. If there are similarities, G. gorilla may be a good model for understanding this extinct hominin.

Monitoring Chlorophyll A and Pheophytin at Crabtree Swamp (Poster Presentation)
James Blankenship (Engineering Science)
The two chemicals compound we will be looking at include chlorophyll A and pheophytin. These two chemicals are common in most waters around the world. While they are helpful for the ecosystem, like most everything, having too much can also be harmful. Having a high concentrate of Chlorophyll A can result in foul smell and green scum on the bottom and surface of water. Likewise, pheophytin can be harmful when it comes to dissolving oxygen in water. This can result in erosion around the water source and can lead to unwanted chemicals in water (4). The results discussed will show how the amount of Chlorophyll A and Pheophytin in the waters of Crabtree swamp are natural and great for the environment.

Initial Investigation of Select Pesticides Present in Wildflower Honey using Headspace Solid-phase Microextraction Coupled with gas chromatography-mass spectrometry (Poster Presentation)
Maura Bramlitt (Chemistry)
Faculty Research Mentor: Drew Budner, Chemistry
Honey has been used as both a food, sugar substitute, and flavor enhancer since the dawn of time. The uses for honey are extremely varied and include, food and medicine. Honey is also an agricultural product and bees have to potential to come into contact with a variety of industrial compounds originating in the pollen sources or in the protection of hive. In this project, the presence of three agricultural products (Coumaphos, Amitraz, and 2,4-dimethylanaline) was investigated in commercially available wild flower honey. Headspace SPME coupled with GC-MS was used to for the analysis and quantification was performed using standard addition in conjunction with an internal standard.

Effects of Continuous and Intermittent Blood Flow Restriction on Physiological Responses during Aerobic Exercise (Poster Presentation)
James Brown (Exercise and Sport Science)
Faculty Research Mentor: Justin Guilkey, Kinesiology
Blood flow restriction (BFR) during exercise improves cardiovascular fitness with lower work-rates compared to traditional exercise, but differences in continuous (CONT-BFR) or intermittent BFR (INT-BFR) are unknown. This study examines physiological responses to light intensity with no BFR (LIIE), INT-BFR, CONT-BFR, and high-intensity interval exercise (HIIE). Subjects will participate in four trials; BFR-INT,

CONT-BFR, LIIE and HIIE. Trials consist of five two-minute intervals with a one-minute recovery interval. During CONT-BFR, cuffs will continuously be inflated at 60% of limb occlusion pressure; INT-BFR is similar except cuffs deflate during recovery intervals. Each trial blood pressure, cardiac output, oxygen uptake, and muscle oxygenation will be measured. Oxygen consumption and cardiac output should be similar across light-intensity trials regardless of BFR, but lower than HIIE. Blood pressure and decline in muscle oxygenation should be the greater in the CONT-BFR compared to INT-BFR; BFR trials will be greater than LIIE but less than HIIE.

Are the Salinity and Enterococci actives Within Safe Levels in North Myrtle Beach's Waters? (Poster Presentation)
Hunter Bulin (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
The water quality in North Myrtle Beach can be seen through salinity and enteroccoi. Salinity is the measure of how much salt there is per liter of water and Enterococci is an indicator bacteria found in fecal matter that determines how clean the water is. The recommended levels for the two respectively are within 33-37 grams per liter and below 104cfu/100ml. Salinity is tested and found through dilution, which is boiling out the water until only salt particles are left and enteroccoi is found through filtration and Colilert and Enterolert testing sticks. Based off the data found at all nine testing sites in North Myrtle Beach from 1997 till now, the salinity has been tested to be at an average of 34.1 grams per liter. Enteroccoi has been at an average mean of 9.5MPN/100ml with a few outliers that have been found to have been tested during or after storms.

Nitrogen Pollution in Surface Water on Highway 544W: How This Impacts the Health and Safety of the Waccamaw River (Poster Presentation)
Savannah Burdette (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Ammonia, nitrite, and nitrate are different chemical forms of nitrogen that can enter surface waters through pollutants carried by rainwater runoff. The main source of nitrogen pollution comes from agricultural fertilizers and manure. When this excess nitrogen along with other chemicals in the fertilizer infiltrate the aquatic ecosystem, the water quality deteriorates and causes death to the organisms living in it. Eutrophication can occur, which is the overgrowth of plant matter and algae. This process depletes the dissolved oxygen supply, which is essential for cellular respiration in many aquatic wildlife species. Between October 11, 2013 and November 16, 2020, 247 nitrogen samples were taken from a body of water located on highway 544W in Conway, SC. The average amount of total nitrogen reported was 0.546 mg/L which is below the EPA(2000) water quality standard of 0.87 mg/L, meaning the water was not considered contaminated with respect to nitrogen.

The Influence of Bottom Type and Stratification on Reef Fish Community Structure at GRNMS (Oral Presentation)
Bridget Campbell (Marine Science)
Faculty Research Mentors: Diane Fribance and Cecilia Krahforst, Marine Science
Physical and oceanographic differences across reef habitats can influence fish distribution. In this study, Gray's Reef National Marine Sanctuary (GRNMS) was surveyed both inside and outside an MPA using echosounder technology and a CTD profiler to assess physical and environmental controls driving reef fish communities. Preliminary results from a PCA-analysis suggest that differences in fish community structure are driven by physical characteristics (e.g. presence of relief and biofouling cover) and water column stratification. The influence of stratification on reef fish structure seems to be present even with changes

in the physical structure. However, the physical structure still seems to be playing the primary role in fish distribution along the reef. Understanding the roles that bottom type and water column stratification play in fish community structure can help to prioritize the preservation of bottom habitats and promote healthier, more complex ecosystems.

Water Monitoring at CCU (Conductivity, pH, DO) (Poster Presentation)
Gage Campbell (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Monitoring water quality is important for human health. This study focuses on the 544 West site and the parameters conductivity, pH, and dissolved oxygen (DO). Data used is from Oct. 2011 through Nov. 2020 on the Coastal Carolina University campus and used an Orionâ„¢ A329 multimeter. 741 samples were collected for Conductivity, with an average of 407.8 uS/cm (145.8 uS/cm - 690.7 uS/cm). 738 samples were collected for pH, with an average of 7.15 (6.09 - 8.11). All data fell within the SC DHEC water quality standard of pH which is no lower than 5.0 or above 8.5. 735 samples were for DO, collected with an average of 7.04 mg/L (0 mg/L - 10.37 mg/L). Less than 10% of data were outliers falling below the SC DHEC water quality standard for DO which is no less than 4 mg/L.

College Student's Attitudes towards Physical and Online Sex Workers (Oral Presentation)
Grace Carrino (Interdisciplinary Studies)
Faculty Research Mentor: Terry Pettijohn II, Psychology
The purpose of this research is to identify college student attitudes towards female physical and online sex workers. Replications of the Bogardus Social Distance Scale (1924) and McCroskey & McCain's Measures of Interpersonal Attraction (1974) will be electronically distributed to an availability of Coastal Carolina University students. The state of research concerning public attitudes towards digital sex workers is extremely limited. This gap in research fails to acknowledge the popularity of digital sex work, for sex workers and consumers, and lacks investigation of how attitudes may differ towards physical and digital sex workers. Further research on attitudes towards online sex workers is necessary to identify how sex worker stigma is evolving with digitalization. Hypotheses were formed using an interdisciplinary lens, highlighting psycho-social theories of mere-exposure and familiarity, as well as feminist theories of female agency.

The Influence of gut microbiota in Development of Alzheimer's disease (Oral Presentation)
Wesley Caudle and Mackenzie Gibbs (Biology)
Faculty Research Mentor: Fang-Ju Lin, Biology
Alzheimer's disease is a neurodegenerative disease that effects the neurons in the brain and can lead to cognitive impairment and death. The main aspects of Alzheimer's research focus on genetic factors contributing to the disease, but the microbiota gut-brain-axis may be playing a potential role in Alzheimer's development. The human body has an abundant microbiota to help our bodies carry out daily needs, but the amount of microbiota present has to be keep in a tolerance range by the immune system. If there is an increase in the amount of gut microbiota present in the human body, inflammation can occur in the CNS and lead to a potential contributor to Alzheimer's development. The aim of this study is to survey the diversity of gut microbiota in the transgenic Alzheimer's fruit fly (Drosophila) model, in comparison with ones in the healthy wild-type Drosophila.

Organic Matter Spatial and Temporal Patterns in Coastal Sands of Long Bay, South Carolina (Oral Presentation)

Kayla Christofferson (Marine Science)
Faculty Research Mentor: Angelos Hannides, Marine Science
Sandy coastlines serve crucial functions to coastal economies and coastal ecology alike. In the past, organic-poor sands were considered of lower importance than organic-rich muds. Recent studies showed that sands' low organic matter concentrations are due to high biogeochemical cycling rates, driven by rapid physical exchange, but remain infrequently studied. We present time-series of sand mass-loss-on-ignition (LOI, an organic matter proxy) profiles from February 2017 onwards at multiple sites along Long Bay, South Carolina. LOI profiles exhibit subsurface maximum values, unlike the typical decrease with depth in muddy sediments. We hypothesize that organic matter distribution with depth is affected by different biogeochemical cycling rates, specifically respiration, at different depths. We compare seasonal patterns of organic matter and sand chlorophyll to detect whether organic matter content is affected by primary productivity cycles. This baseline study may assist in evaluations of disturbances of sandy shores of the Grand Strand in the future.

Measuring Total Coliform and E. Coli Counts at Surfside Beach, South Carolina (Poster Presentation)
Carissa Church (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Coliforms are bacteria that are present in the intestinal track of all humans and other warm-blooded animals, with large numbers being found in feces. E. coli is a species of coliform with specific strains being harmful to humans. E. coli can be the cause of an array of intestinal infections ranging in severity. It is important to test water quality for coliform bacteria to determine if the water being tested has come in contact with fecal matter. The tests conducted for both total coliforms and E. coli were done with Micrology's Coliscan Easygel medium. Between May 27, 2010 and February 9, 2021, 242 samples were collected on 11th Avenue at Surfside Beach. The mean total coliform and E. coli counts are 864.6 CFU/100 mL and 118.9 CFU/100 mL respectively, which are in accordance with USGS and S.C. DHEC water quality standards of 1200 CFU/100 mL and 126 CFU/100 mL.

How Does Turbidity & TDS Affect Water Quality & the ECO system (Oral Presentation)
J. Kered Class (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
We did our testing at 501 West right beside Coastal Carolina University in Conway, SC. measuring the Turbidity, and TDS of the water quality. Turbidity measures the water clarity, haziness, and cloudiness or the material suspended in water decreasing the passage of light that goes through the water. These materials include algae, plankton, microbes, and soil particles such as clay, silt, and sand. Turbidity indicates the effects from the results of construction, agricultural, logging, and discharges. The elevated levels of turbidity will increase the temperature, which lowers DO in the water. This negatively affects the overall health of aquatic life forms. The materials used to calculate turbidity is called Hach 2100P Turbidimeter. TDS, total dissolved solids and is the total concentration of dissolved substance in water. TDS is made up of inorganic salts, also includes small amount of organic matter. The minerals can be found from natural and human activities.

The Role of Religion and Politics in the Evolution of Saudi Arabia (Oral Presentation)
Hannah Clegg (Intelligence & National Security Studies)
Faculty Research Mentor: Aneilya Barnes and Christopher Ferrero, History and Intelligence & National Security Studies
The Kingdom of Saudi Arabia is historically grounded in Wahhabism, a form of Islam that partnered with the government and helped unify numerous tribes living in the Arabian Peninsula. This alliance, known as

the Pact of 1744, created two monopolies of influence " “religious clerics and the royal family " “which legitimized each other and served as the foundation of Saudi society.” This relationship has been symbiotic; however, it has also conflicted over modernization efforts. In the regional context, Saudi Arabia continues to be an ideological force for the Muslim world and partially secured this position due to the presence of its key religious cities, Mecca and Medina. The impact of this continued connection between religion and politics is examined through literature discussing Islam, religious reform, and government leadership to detail its role in the evolution of Saudi Arabia.

Does Coastal Carolina Wall Pond Bridge Have Too Much Nitrogen? (Poster Presentation)
Jacquelyn Colangelo (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Nitrite, nitrate, and ammonia are all forms of nitrogen. Excessive amounts of ammonia, nitrates, and nitrites can accelerate eutrophication, causing dramatic increases in aquatic plant growth and changes in the types of plants and animals that live in the pond. The level of nitrate should range from 0-50 mg/L, nitrite should range from 0-3.0 mg/L, and ammonia should range from 0-6 ppm. Excess nitrates can cause hypoxia (low levels of dissolved oxygen) and can become toxic to warm-blooded animals at higher concentrations (10 mg/L) or higher) under certain conditions. This research was conducted at the Wall Pond Bridge on Coastal Carolina University's main campus. The measurements were taken using Hach test strips. It was not found that there was too much nitrogen in the pond.

Francesco Landini: Increased Musical Abilities among Visually-Impaired Musicians (Oral Presentation)
Hailey Cornell (Music Education, BME)
Faculty Research Mentor: Eric Crawford, Music
Many visually-impaired musicians have been renowned for their musical accomplishments and talents. From Francesco Landini, a 14th century Italian musician famously known for playing the portable organ, to multi-instrumentalist and singer Stevie Wonder, these musicians appear unencumbered musically by their visual handicap. Scholars argue that blindness may contribute to heightened musical skills among these musicians. My presentation will examine research studies to determine the likelihood of perfect pitch among congenitally blind musicians. This heightened aural ability would give these musicians a distinct advantage in music study and composition. I also compare compositions of Wonder and Landini to peer sighted musicians in determining harmonic, melodic, and rhythmic differences. I focus on reasons for the complexity in the music of these two blind composers. My research may encourage visually-impaired students to pursue music by discussing the hidden strengths and accomplishments achieved by people who also face the unique challenge of visual impairment.

Initial Investigation of Wildflower Honey using Headspace solid-phase Microextraction Coupled with Gas Chromatography-mass Spectrometry for Geographical Information (Poster Presentation)
Tyra Countiss (Biology)
Faculty Research Mentor: Drew Budner, Chemistry
Honey has been used as a food, sugar substitute, and flavor enhancer forever. The uses for honey are extremely varied from food to medicine. It is widely touted that you can address seasonal allergies, especially those following a move, by eating local honey. For this to be true the composition of the local honey, including trapped pollen, would allow allergy symptoms to be eliminated. In this project, the volatile and semi-volatile aroma compounds in wild flower honey from several different locations were analyzed. Headspace SPME coupled with GC-MS will be used to help develop the characteristic flavor and aroma profiles of each honey analyzed. Then in combination with statistical analysis, such as principle

component or cluster analysis, allowed for the characterizing of these honeys based on location. The goal of this project is to detect regional variations in honey to begin to establish the idea of terroir for honey.

Analyzing Uncertainty and Economic Setbacks of COVID-19 in South Carolina (Oral Presentation)
David Custer (Applied Statistics)
Faculty Research Mentor: *Lindsey Bell, Mathematics and Statisticso*
Tourism is not the only staple driving economic growth here in our Palmetto State. The South Carolinian economy has transitioned from an agrarian-oriented economy to a modernized manufacturing center for prominent corporations such as Boeing, Michelin, AVX, and BMW. Furthermore, these firms rely on supply chains to expand operations to provide employment opportunities in rural and urban environments. Unfortunately, COVID-19 was an unforeseen obstacle that hindered commercial growth and caused state revenues to plummet. Businesses must recognize the origin of their financial difficulties to mitigate capital loss from the pandemic. By using statistical methods, we can understand which factors were most influential in undermining the economic stability of South Carolina.

pH Low Insertion Peptide (pHLIP) Insertion Pathway into the Membrane (Oral Presentation)
Natalie and Megan Cyterski (Biology)
Faculty Research Mentor: Ganga Sharma, Physics and Engineering Science
The pH (low) insertion peptide (pHLIP) targets acidity at the surfaces of cancer cells and shows utility in a wide range of applications, including tumor imaging and intracellular delivery of therapeutic agents. It transforms from coil to interfacial helix and then inserts into the cell membrane with transmembrane orientation. Experimental, computational, and analytic studies have opened the door to develop a pHLIP technology platform for cancer diagnosis and treatment. This talk will mainly focus on our investigation in the quest to find optimal pHLIP insertion pathway into the membrane.

A Collaborative Analysis of British Literature (Oral Presentation)
Chrissandra Dandy, Hannah Yurkin, Kyle Blandford and Melanie Schlesser (English)
Faculty Research Mentor: Kate Oestreich, English
In Dr. Oestreich's ENGL 300 class, a research-intensive course that allows English majors to examine a critical issue that is current in English studies, we explored impacts of digital media on analysis of nineteenth-century British literature. We utilized the COVE (Collaborative Organization for Virtual Education) to create timelines, an interactive map, and to annotate the novels. While we all created a topic of our choosing, we combined our research into one digital project, helping us find connections in the works. Everyone had access to each other's assignments. Therefore, we learned from and taught each other, revealing that we shared interests in topics such as misogyny and vanity within the novels. We will present a portion of our final projects as well as our favorite research written by a classmate, highlighting the collaborative nature of our research. This approach helped us become closer to one another during a time of pandemic.

The Manipulation of Light in an Elementary Classroom (Oral Presentation)
Sydney Daniel (Elementary Education)
Faculty Research Mentor: Richard Costner, Foundations, Curriculum and Instruction
Research shows light affects humans in all faucets of life. The functionality of light can be seen in Elementary schools and classrooms, which are filled with students maneuvering and progressing through cycles from beginning of the year to the end. According to Panel, et.al. (2011,) "Light is a structural component in school classrooms." Light consists of two components: illuminance and color temperature " “both are used to view the purpose of light.” These factors combined create the effects of warm and

cold atmospheres in an elementary classroom, and each specific combination of illuminance and color temperature create their own unique result that benefits vision, concentration, and communication and social behavior. Various classrooms in elementary schools were used to observe the structure and use of lights within the classroom. Results of these observations will show the use of different lights within a classroom and the teachers' purpose for manipulating the lights.

Measuring Nitrogen levels in Stormwater Runoff to Waccamaw River, South Carolina (Poster Presentation)
Julianna Davis (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
This research monitored the density of Nitrates, Nitrites, and Ammonia, and compared the results to the South Carolina DHEC's standards for water quality. The water sampled is a pond on Coastal Carolina University's campus in Conway, South Carolina and is one of the bodies of water that contributes to the Waccamaw River, which is a source of drinking water. Therefore, it is necessary to check the water quality and ensure that it is safe to drink. This research was conducted by the WWA Volunteer Monitoring Program, and 250 samples were taken between October 13th, 2011, and November 16th, 2020. The mean Nitrate concentration and lowest standard was 0.042 mg/L, 0.087 mg/L respectively. The mean Nitrite concentration and standard is 0.001 mg/L and 10mg/L respectively. Mean Ammonia concentration and lowest standard was 0.186 mg/L and 0.5 mg/L respectively.

Detecting Radium-226 in Submarine Groundwater Discharge (Poster Presentation)
Rashaun Davis (Engineering Science)
Faculty Research Mentor: Monica Gray and George Hitt, Physics and Engineering Science
Studies have been done to see if abundance of neutrinos have an effect on the decay rate of radioactive nuclei. Questions regarding the proximity of the sun and the concentration of the flux of neutrinos as a result, have emerged due to there being more counts in the winter when the sun is closer versus there being less counts in the summer when the sun is further away. Other studies say that the cause of the difference in counts are more local, as in the environmental conditions like temperature and various background radiation that interferes with the counts of the target isotype. Using a geiger muller counter the emissions from various isotopes, one being Radium-226 that can be found in submarine groundwater.

Investigation of Potential Protactinium Safeguards Vulnerabilities for Thorium Fuel Cycles (Oral Presentation)
Victoria Davis (Engineering Science and Applied Physics)
Faculty Research Mentor: George Hitt and Braden Goddard, Physics and Engineering Science
This research focuses on safeguards issues regarding thorium-based nuclear reactors. The Th-232 in the reactors is converted into Th-233. The Th-233 decays to Pa-233, which later decays to U-233. Pa-233 is not a safeguarded material, and therefore could possibly be diverted out of the reactor to produce unmonitored U-233. Pa-232 and Pa-234 are also produced in the reactor and decay to U-232 and U-234, respectively. Because Pa-232 and Pa-234 have shorter half-lives than Pa-233, the Pa-233 will make up the largest protactinium percentage over time. If the decayed uranium is separated from the Pa-233, this will lead to more purified U-233 once the Pa-233 decays. To better understand the mixed protactinium gamma radiation sources, three isotopes are modeled using Monte Carlo based radiation transport with spectral results then being fed into a spreadsheet tool to create a visualization of the spectra. This tool can facilitate improvements in nonproliferation and safeguards.

Risk Mapping of Possible Forest Fires in California (Oral Presentation)

Allison DeBoy (Digital Culture and Design)
Faculty Research Mentors: Aneilya Barnes and Susan Bergeron, History and Anthropology & Geography
In the past decade, climate change effects have increased drastically, impacting the number of forest fires occurring across the world. This study seeks to examine identified and mapped forests within California and explore environmental and cultural factors that play significant roles in determining the likelihood of forest fires occurring at each location. Primary data sets for this study include GIS map layers of temperatures, forest cover, droughts, and locations of past fires across California. It also incorporates information on specific types of forests and trees found in the state and collected statistics on different dynamics of fire conditions. Combining all the collected data and creating separate map layers for each feature will result in one layered GIS risk map that shows predictions for the likelihood of forest fires occurring in specific locations across California, making better preparation for future forest fires possible, especially in forest areas of higher risk.

Visualizing Health Inequality in Sumter County, SC (Oral Presentation)
Hanna Deckert (Health Administration)
Faculty Research Mentor: Stephen Borders, Health Administration
As a nation, we continue to make progress in health status and life expectancy, yet these gains have been uneven. Large inequalities exist and are often divided along racial lines. To measure these inequities, we created a Community Health Index based on 27 Center for Disease Control and Prevention (CDC) measures to better capture health inequality at more localized levels. To visualize these inequalities, we created an interactive dashboard and infographic at the census tract level to provide clearer insights. Using data from the American Community Survey, we add important factors, such as income and education, which are associated with health inequalities to add further understanding. These visualizations can assist public health officials and policymakers to better assess overall community needs, allocate funding, estimate the amount of resources needed to reduce disparities, and identify communities that need continued and ongoing support.

Analysis of E. Coli and Total Coliform in Pond 501 West in Coastal Carolina University (Poster Presentation)
Nathan Dempski (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
E. Coli is a bacterial group linked to gastrointestinal illness, while Total Coliforms are usually linked to harmful bacteria and other specific sources of pollution. Monitoring small waterways for pollutants is important because of the runoff into major waterways, which Urbanization increases. The Conway area has experienced a lot of urbanization, so keeping its waterways healthy is a top priority. Using the Coliscan Easygel PLUS Media method, total coliform and E.coli levels in the sampled waterways of 501 West were tested. From October 13, 2011 to November 16th, 2020, 249 samples were taken from the sample site. The average E. Coli and Total Coliform CFU levels were 287 /100mL and 1,143 /100mL respectively. E. Coli's average was less than the SC DHEC and EPA (2012) standards, though many samples were outliers that well exceeded those standards. Total Coliform's average managed to stay below the SC DHEC and EPA (2012) standards.

Measuring Turbidity and TDS levels on Coastal Carolina University's Campus Location 544 West (Poster Presentation)
Duvall Dickerson-Evans (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science

Turbidity can be described as how clear a liquid is based off the number of particles in the fluid, causing the liquid to be either cloudy or clear. TDS (total dissolved solids) is the total number of dissolved substances in the water. If the turbidity is too high it could affect the photosynthesis of marine plants, along with the visibility of predators in the water, it could also lead to the water being able to carry diseases. 741 samples were collected from October 13, 2011 to November 16, 2020, using the HACH 2100Q turbidimeter at 544 West on Coastal Carolina University's campus. The median value of turbidity that was collected from 544 West was 5.8 NTU, which is slightly above the EPA (2000) water quality standard which is 3.89 NTU, but it is below the S.C. DHEC standard which is not to exceed 50 NTUs.

Acute Physiological and Perceptional Responses to Unilateral versus Bilateral Walking with Blood Flow Restriction (Poster Presentation)
Sage Donaldson (Exercise and Sport Science)
Faculty Research Mentor: Jakob Lauver, Kinesiology
The use of blood flow restriction (BFR) has skyrocketed in popularity in the past few years as a therapeutic modality. Studies have shown that the application of BFR at 20-30% of maximal oxygen consumption (VO2max) yields similar improvements in cardiovascular fitness, muscle mass, and strength when compared with traditional exercise at 60-90% of VO2max. The substantially lower workload accompanying BFR allows for more tolerable workloads in special populations, such as those recovering from musculoskeletal injury. Because previous studies regarding BFR have mainly focused on bilateral BFR, it is unclear how unilateral BFR compares to bilateral BFR. Therefore, the purpose of this investigation was to examine the acute physiological and perceptual responses to BFR applied bilateral and unilateral during walking. Participants completed three randomized walking trials; control, bilateral BFR, and unilateral BFR. During each trial muscle excitation, tissue oxygenation, VO2, heart rate, discomfort, and rating of perceived exertion were assessed.

Gun Violence: An Analysis of Public Perception and Experience in the Southeast (Oral Presentation)
Caroline Durham1, Armani Sumpter1, and Jonah Nordeen2 (Public Health1 and Biochemistry2)
Faculty Research Mentor: Sharon Thompson, Health Sciences
Gun violence is an underexamined, controversial, and widespread issue that affects millions in the United States every year. Americans are 25 times more likely to die from gun violence than residents of peer nations. Annually, 36,000 deaths are attributed to gun-related incidents, more than 800 of which occur in South Carolina. This 2020 study examined the gun violence beliefs of 1003 participants based on the presence or lack of guns in southeastern households. In order to examine perceptions of gun violence, data were collected regarding public perceptions of appropriate gun use, gun policy opinions, and personal knowledge of gun violence victims. Methods used to obtain data included online and paper-pencil surveys, which were promoted in person and through social media. Further research and education are needed to reduce the prevalence of gun violence and misconceptions. Results will be discussed.

New findings in Fundamental Physics or Discrepant Measurements? (Poster Presentation)
Alex Eggleston (Engineering Science)
Faculty Research Mentors: George Hitt and Monica Gray, Physics and Engineering Science
The half-life of a radioactive isotope can be defined as the amount of time that it takes for said isotope to decay to half of its original value. Radioactive isotopes have a set half-life, this helps scientists create more precise measurements and predictions during experiments because of the set timeline for each specific isotope. The half-life of Thallium-204 is recorded in the experiments to create a random number generator based off of the small spread of decay amounts during different time segments. During the experiments, a Geiger"“MuÌˆller detector was used to record the half-life of Thallium-204. While doing such

experiments, Dr. Ephraim Fischbach found that during the summer, when the Earth is further from the Sun, the half-life of Thallium-204 is slower than during the winter. After observing the results, Dr. Ephraim Fischbach concluded that because the Earth is closer to the Sun during the winter that the Earth is receiving more neutrinos that the Sun is emitting. Dr. Ephraim Fischbach then concluded that because there are extra neutrinos entering the atmosphere in the winter, that the neutrinos were interacting with the radioactive material and causing particles to deflect which changes the data recordings made by the Geiger"“MulÌˆller detector. After reviewing and replicating Dr. Ephraim Fischbach's experiments, we found that there might be a different variable that could explain the possible discrepancies in Dr. Fischbach's results. During our experiments, a temperature variable was found to slightly change the results collected from the Geiger"“MulÌˆller detector. After applying an exponential curve to account for the temperature changes, the results seem to follow the natural laws of physics and do not seem to indicate any new findings in fundamental phyiscs.

Diatom Assemblage Used as an Indicator of Extreme Inland Flooding (Oral Presentation)
Andrew Einhorn (Marine Science)
Faculty Research Mentor: Zhixiong Shen, Marine Science
Coarseness of floodplain sediment is indicative of extreme paleoflood, but not their causes. Diatoms, abundant in fluvial deposits, may reveal the causes of extreme flooding due to their sensitivity to environment changes, but their correlation to extreme flooding has not been established. This study aims testing whether diatom assemblages in fluvial deposits is sensitive to extreme river flooding. Deposits from a sediment core taken from an oxbow lake of the Waccamaw River were identified as flooding or non-flooding based on grain-size analysis. Diatoms were subsequently extracted and purified from the sediments using a method modified from Morley et al. (2004) and counted. The diatom assemblage is dominated by the genus Aulacoseria in flood deposits, but Eunotia and Pinnularia in non-flood deposits. The assemblages in flood and non-flood deposits are different according to the Bray-Curtis Similarity test, suggesting that diatom assemblage may be used as a paleoflood indicator.

Synapomorphic Patterns in HIV Gag Gene Sequences (Poster Presentation)
Samantha Elsey (Biology)
Faculty Research Mentor: Megan Cevasco, Biology
The Human Immunodeficiency Virus (HIV) is globally distributed and effects millions of people worldwide. Better understanding the global distribution and diversity of the HIV virus allows for more accurate treatment, and tracing to be followed more closely. In this study, multiple sequence alignment tools were used to determine if there were group defining synapomorphies characterized by diversity in the gag gene. This was done by using seventeen sequenced HIV strains from six different countries, and generating a variety multiple sequences alignments under varied substitution and indel costs. Results showed that distinct genotypes of the HIV gag gene revealed both geographic and evolutionary patterns.

The COVID-19 Sentinel Project: Monitoring the Incident Rate of COVID-19 on Campus (Poster Presentation)
Madison Gentilo (Biology)
Faculty Research Mentor: Paul Richardson, Chemistry
The COVID-19 Sentinel Project was created to monitor the rate of COVID-19 infections in individuals who determined themselves to be healthy and an active member of the Coastal Carolina Community. During the summer of 2020 Dr Michelle Barthet and Dr Paul E. Richardson developed a tongue swab test that detects COVID-19. As well as COVID testing, the study also contained a survey that was conducted to ascertain participants’ actions before testing and personal feelings pertaining to

the ongoing pandemic. Additionally, the survey asked participants if they had certain symptoms associated with COVID-19. The purpose of this study was to develop a monitoring program that could help determine the risk of infection in our campus community and any behaviors that might indicate risky behavior. The data collected shows that while there was a higher case number in a specific testing site, contract tracing never indicated that this particular site was associated with an outbreak cluster. This suggests that protocols put in place by Coastal Carolina University to limit the spread of the virus were effective in limiting the infection rate on campus. The survey also indicated some very unexpected attitudes from our participants toward the handling of the current pandemic.

"Damn Gina"? Analyzing Gender and Sexuality in the Romantic Narratives of '90s African American Television Shows (Oral Presentation)
Catherine Gore-Gause (Communication)
Faculty Research Mentor: Corinne Dalelio, Communications, Media and Culture
Choice-driven streaming platforms have made it seem as if there is more African-American leads in television by making it easier for new generations to access these older television programs, but in actuality it is the minimality of choices that forces audiences of African- American television to connect with and learn from 1990's programming. The goal of my research is to find the link between portrayals of African-American relationships within African-American television media and conformations of master narratives that marginalize people within the African American community. I conducted a content analysis of Martin, Living Single, and A Different World. I choose these shows because the main characters of these shows are composed of young African-American adults capable of having legitimate romantic relationships independent of parental guidance. The coding I chose identified narratives and portrayals through relationship type, gender identity, skin color, sexuality, acts of agency, and one's seeking for a relationship.

Confirmation Bias in Police Decision Making (Poster Presentation)
Bridget Greenhalgh (Psychology)
Faculty Research Mentor: Skye Woestehoff, Psychology
Confirmation bias is the phenomenon in which individuals seek and interpret information that confirms their existing beliefs. Police investigators can experience confirmation bias in the form of a guilt bias. This occurs when Investigators believe a suspect is guilty and seek evidence that confirms the suspect is guilty. The present study investigated the factors that may influence confirmation bias such as years of investigator experience and eye-witness confirmatory evidence.

Using Creative Writing and Literacy to Dismantle the School to Prison Pipeline (Poster Presentation)
Tyler Gross (Special Education Multi-Categorical)
Faculty Research Mentor: Tiffany Hollis, Special Education
The primary purpose of this research was to elevate the voices of minoritized girls of color (those with intersecting identities such as being Black, Brown and/or gender nonconforming, and/or having a disability) through creative writing and literacy, by engaging them in a process of inquiry that allowed them to creatively express themselves and to share their experiences within the school-to-prison pipeline. Using creative writing and a curriculum that the researcher created, the young women participating in various activities that helped them share their experiences and allowed them to think about countering the narrative about young girls of color and with intersecting identities in alternative education settings. As a result, they presented their findings to educators and administrators; sharing their experiences within the school-to-prison pipeline, as well as the growth shown, and the skills gained that they experienced from participating in the program.

Myoglobin Mutations from Differing Altitudes (Poster Presentation)
Taylor Hackett (Biology)
Faculty Research Mentor: *Megan Cevasco, Biology*
Myoglobin is an oxygen carrying protein in muscle that allows adaptation to environmental stress regulation of hypoxia, which is the loss of oxygen in tissues to sustain proper function. Studies have indicated that muscles with higher myoglobin expression have enhanced ability to obtain oxygen in situations where hypoxic 3conditions occur. Building upon the study by Ma et al. (2013) focusing on high-altitude Tibetan antelope and low altitude sheep, myoglobin sequences were compared to determine if there were any significant mutations that led to change in taxa's ability to bind oxygen. This project phylogenetically analyzes seventeen additional sequences of the myoglobin gene to assess adaptations to environmental stress.

Water Quality Monitoring for PH, Dissolved Oxygen, and Conductivity at 501 West (Poster Presentation)
Justin Henry (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Water quality can be assessed by monitoring pH, DO, and conductivity. PH levels lower than 7 are acidic while pH greater than 7 are alkaline. pH levels are crucial when it comes to maintaining a healthy habitat for organisms. Most organisms are comfortable in pH ranging from 6.5-8. Conductivity is the ability of water to pass an electric current. Changes in conductivity can indicate that a water source is polluted. Dissolved Oxygen is the measure of oxygen dissolved in water. Dissolved Oxygen is directly related to temperature of water. For this project, pH and conductivity were measured using a portable Hanna HI 9828 meter with multiparameter; pH/ORP/EC/DO/Temperature probes at the 501 West site on Coastal Carolina University's campus from October 13, 2011 to November 16, 2020. The mean pH, conductivity and DO results were 6.63 recorded (all the means for all the parameter), which is within the SCDHEC accepted range.

Water Quality in Georgetown County (Poster Presentation)
Hobie Hobart (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Enterococcus is a type of bacteria that lives in the human GI tract. Conductivity inside water is the understanding the ability of water to pass an electrical current. Salt comes from mainly two sources thought the world. "Rocks on land are the major source of salts dissolved in seawater. All these areas they are being monitored for enterococcus for salinity, conductivity & enterococci between times of May 08, 1997 to January 25, 2021. The results of the water quality at Huntington State Park are as follows: Salinity 34.7 PSU, based on geographic trend map this average puts the salinity level in the 76%-90% range. Conductivity in this location is not available. Enterococci is on average 9MPN/100Ml, based on the geographic map this average is 26%-50% range.

Aid as a Screwdriver, Violence as the Nail: The Uncertain Effects of Aid on Violence in Iraq, 2004-2010 (Oral Presentation)
Morgan-McKay Hoppmann (Intelligence & National Security Studies)
Faculty Research Mentor: Jonathan Acuff, Politics
Can development aid reduce violence? This study looks at the empirical record of the United States' military in Iraq between 2004 and 2010 to address this question. Evidence from the Community Stabilization Program, the Falluja Waste Water Treatment System, and modest-sized Commanders' Emergency Response Program projects suggests that development aid can only effectively reduce violence when implemented in an already-secure location. When implemented in an insecure location,

development aid and stabilization projects are likely to have no impact on or increase the levels of violence. While development aid is valuable in many respects, the findings of this study suggest it is not an appropriate tool to utilize if the goal is to reduce violence.

Evaluation of Different Isotopes in Brachytherapy Seeds Using Monte Carlo Simulations in the EGSnrc Software (Oral Presentation)
Klea Hoxha (Biochemistry)
Faculty Research Mentor: George Hitt, Physics and Engineering Science
Brachytherapy treatment is a method of cancer treatment with very high regional selectivity. Unlike other forms of cancer treatment, Brachytherapy does very little damage to healthy tissue surrounding the targeted area. Brachytherapy seeds are the key components of this type of treatment. They are rice grain-sized capsules that contain different types of radioactive isotopes which emit radiation with a short range in tissue. Brachytherapy seeds can be surgically implanted inside or around a targeted area and once the entire dose is delivered, they become inert and safely remain inside the body. Seeds come in different types depending on the isotope inside them. Some common isotopes include Iridium-192, Iodine-125, and Cesium-131. The isotope used dictates the seed's radiation properties like intensity, dose, range, and the time it remains active. The research conducted aims to study the different isotopes that compose Brachytherapy seeds by constructing Monte Carlo simulations in the EGSnrc Software.

Nitrogen and Phosphorus effects on Crabtree Swamp water (Poster Presentation)
Ronny Hucks (Engineering Science*)*
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Brachytherapy treatment is a method of cancer treatment with very high regional selectivity. Unlike other forms of cancer treatment, Brachytherapy does very little damage to healthy tissue surrounding the targeted area. Brachytherapy seeds are the key components of this type of treatment. They are rice grain-sized capsules that contain different types of radioactive isotopes which emit radiation with a short range in tissue. Brachytherapy seeds can be surgically implanted inside or around a targeted area and once the entire dose is delivered, they become inert and safely remain inside the body. Seeds come in different types depending on the isotope inside them. Some common isotopes include Iridium-192, Iodine-125, and Cesium-131. The isotope used dictates the seed's radiation properties like intensity, dose, range, and the time it remains active. The research conducted aims to study the different isotopes that compose Brachytherapy seeds by constructing Monte Carlo simulations in the EGSnrc Software.

Shark Diversity and Relative Abundance at Myrtle Beach, SC Fishing Piers (Poster presentation)
Lynsey Isner (Marine Science)
Faculty Research Mentor: Dan Abel, Marine Science
Fishing piers offer structural habitats and foraging opportunities for smaller fish species. In turn, these species, as well as bait from fishers and entrails from cleaning their catch can attract sharks. This abundance of sharks around piers, however, is relatively understudied. We assessed shark occurrence for three months at five local SC fishing piers to address these knowledge gaps. At each pier, abundance counts were recorded along with water quality parameters to better understand drivers of shark presence and behavior. Photos and videos were also taken for better identification of abundance counts to species. We found that shark abundance is influenced by temperature, tidal stage, and salinity. These results correlate with the migratory pattern of local shark species in relation to changing seasons. Of the 30 local shark species seen off the SC coast, only Blacktip and Sandbar sharks were observed in this study. This

study is important to understand if water quality parameters are significantly influencing shark presence, or if fisherman bait is the only factor.

The (Final) Days of Our Lives: An Analysis of End-of-Life Health Care in Soap Operas (Oral Presentation)
Danielle Johnson (Communication and Public Health)
Faculty Research Mentor: Corinne Dalelio, Communications, Media and Culture
In the real world, discussing end-of-life (EOL) care is often shied away from due to its sensitive nature. The same cannot be said for the world of soap operas, where characters frequently live, die, and resurrect. While few research studies related to EOL care and soap operas have only been conducted within the last decade (Cruz-Oliver et al, 2016; Mitchell et al, 2019), no research has analyzed the portrayal of EOL health care in U.S. television soap operas. Through a content analysis, I have examined episodes from the top 4 daytime television soap operas in the United States for patient/physician conversations related to EOL care. Each conversation was coded for topic, tone, and theme. The results of this content analysis will be beneficial for future work done by public health leaders and communication researchers. Cruz-Oliver, D., Malmstrom, T., Roegner, M., & Yeo, G. (2016). Evaluation of a video based seminar to raise health care professionals' awareness of culturally sensitive end-of-life Care. Journal of Pain and Symptom Management, 54(4), 546 - 554.
https://doi.org/10.1016/j.jpainsymman.2017.07.023
Mitchell, S., Spry, J., Hill, E., Coad, J., Dale, J., & Plunkett, A. (2019). Parental experiences of end of life care decision-making for children with life-limiting conditions in the paediatric intensive care unit: a qualitative interview study. BMJ Open, 9(5), e028548"". https://doi.org/10.1136/bmjopen-2018-028548

Economic Effect of Localized Anthropogenic Seafloor Changes in the Florida Keys (Oral Presentation)
Johnathan Johnson (Anthropology and Geography)
Faculty Research Mentors: Aneilya Barnes and Clayton Whiteside, History and Anthropology & Geography
As the seafloor is a mostly static surface, the smallest alterations are capable of changing the localized area for both sea and land-goers. Hundreds of shipwrecks and artificial reef habitats exist within the Florida Keys and Gulf of Mexico and play instrumental roles in the ecological and economic landscape for nearby coastal communities. These artificial reef habitats form self-sustaining ecosystems on the seafloor and attract swaths of both human and aquatic visitors. Many locations of shipwrecks off the Florida Keys are logged with GPS within open-access databases. This research analyzes prevalent sites of human seafloor alterations (e.g. dredging, shipwrecks, etc.) near Marathon Key as one of the many instances in which an altered seafloor presents unforeseen ramifications to both the physical and human landscape. Site history, depth, and relief are also considered, and geospatial tools are examined to understand how local communities use these seafloor alterations for commercial success.

Use of Loom-Mediated Isothermal Amplification (LAMP) for the Detection Tomato Mosaic Virus (Oral Presentation)
Caleb Jones (Biology and Chemistry)
Faculty Research Mentor: Michelle Barthet, Biology
Tomato Mosaic Virus (ToMV) is a rapidly spreading single-strand RNA virus that can quickly infect and destroy entire crop yields. As there is no cure for ToMV, early detection is key; the infected plants must be identified, isolated, and destroyed before the infection spreads. Our aim was to develop a testing strategy that not only had the specificity to detect ToMV but could also be implemented in the field and quickly determine infection. Prior to this study, the most common form of detection was by use of polymerase chain reaction. While accurate, this testing method is costly and takes time, leading to greater crop loss. Our method used Loop Mediated Isothermal Amplification (LAMP) with specifically designed

primers to target the coding region of the viral RNA responsible for the production of coat proteins. We were able to identify infected plants in as little as five minutes and with limited equipment.

Nuclear Islam: Pakistan and the Bomb (Oral Presentation)
Kevin Joyce (Intelligence & National Security Studies)
Faculty Research Mentor: Joseph Fitsanakis, Politics
Pakistan is the second largest predominantly Muslim country in the world and the only Muslim-majority country possessing and manufacturing nuclear weapons. Nuclear experts debate on the degree of safety of Pakistan's 160 nuclear warheads that lay in control by its military. It is predicted that by 2030, that Pakistan could possess the world's third largest nuclear arsenal, leaving many Western countries, especially the United States, on edge. Reports claim the existence of insider sympathies towards the many Islamic extremist groups in the region. These include the Taliban, Al-Qaeda, Lashkar-e-Taiba, and Jaish-e-Mohammad. Slowly, Pakistani nuclear facilities have been and are being discovered and targeted by Islamic extremist groups. Namely, the Taliban and Al-Qaeda have stated their intents of use, if they possessed nuclear weapons. Although if operationalized, questions arise around the Qur'anic justifications these groups believe allow them to use nuclear weapons against their enemies, especially their enemies in the West.

Women's Collegiate Lacrosse team Cardiorespiratory Fitness and Muscular Strength (Poster Presentation)
Kaylee Kaczvinsky (Exercise and Sport Science)
Faculty Research Mentor: Justin Guilkey, Kinesiology
The study is characterizing cardiorespiratory fitness and muscular strength in women's collegiate lacrosse players. It will examine maximal heart rate, maximal oxygen consumption and hamstring and quadriceps muscle strength and compare between positions. There are multiple athletes that each play a different position which will affect their cardiorespiratory fitness and muscular strength. For maximal heart rate and oxygen consumption, a cycle ergometer will increase in work rate until the point of fatigue. A Cosmed Quark metabolic cart will measure oxygen consumption and heart rate. The muscular strength test measures the athlete's quadriceps and hamstring ratio at two different isokinetic speeds. It is expected that positions require the athlete to be up and down the field the whole game will have greater aerobic fitness, while positions like the goalie will have lower aerobic fitness. Positions of power, like goalie, are going to have stronger hamstrings and quadriceps.

Monitoring Conductivity Levels at the Head and Mouth of the Swash in Briarcliffe Acres (Poster Presentation)
Ryan Kerns (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Conductivity is the ability of water to conduct electricity. It is a measurement of the total amount of dissolved solids. Monitoring water conductivity can lead to a better understanding of pollutants in the environment. During the monitoring samples were taken between Feb 20, 2019 to Feb 17, 2021. These samples were taken from the Head and Mouth of Swash and Cabana road at Briarcliffe Acres in South Carolina. The measurements conducted are conductivity measurements in laboratory with Hach HQ40d reference method: SM 2510 A-2011 and 2510 B-2011. Over 45 samples have a median around 50,075 micro siemens and outliers all the way down to 5,510 at one point with the highest outlier being 54,500.

The Effect of Sunscreen on the Life Expectancy of *Palaemonetes pugio* (Oral Presentation)

Allison Kladler (Marine Science)
Faculty Research Mentor: Eric Rosch, Marine Science
Sunscreen is a significant source of metals and inorganic nutrients to coastal waters. This presents potential hazards for marine ecology as both organic and inorganic chemical UV filters incorporated in the formulation of sunscreens are being added to seawater, disrupting the naturally occurring balance in our waterways. This study aims to evaluate the presence of sunscreen particles on the lifespan of **Palaemonetes pugio**. Varying amounts of sunscreen were dissolved in vented glassware containing seawater. Individual shrimp were placed in glassware and the average time of death was recorded. Experimentation showed that the average time of death decreased with increasing mass concentration of sunscreen. As time increased, the color of the shrimp's body transformed from clear to white, suggesting higher concentrations in absorption of the sunscreen inside the organism. Their vulnerability is a cause for concern since this species is instrumental in transporting energy and nutrients between various estuarine trophic levels.

A Sclerochronological Analysis of Eastern oysters (*Crassostrea virginica*) in North Inlet estuary, South Carolina (Oral Presentation)
James Klein (Marine Science)
Faculty Research Mentor: Juliana Harding, Marine Science
Eastern oysters (*Crassostrea virginica*) provide ecological services in many estuaries. Individual physiological rates and scope for growth are influenced by ambient temperature, salinity, and food conditions. The seasonality of internal shell growth signature deposition in North Inlet estuary, South Carolina oysters was evaluated using quantitative and qualitative analyses of shells collected at monthly intervals. A cross-section along the growth axis of each left valve was used to measure the distance from the previous growth signature to the terminal edge, which was the newest growth increment at the time of collection. Distance measurements standardized to shell height (to correct for ontogeny) will be related to measured ambient habitat conditions during the growth interval. A deeper understanding of internal growth signatures and the effects of temperature, salinity, and food availability will thereby provide insight on local oyster growth patterns and the associated ecosystem services.

Effects of Carbon-14Rradioactivity Variations in Medical Dosimetry (Poster Presentation)
Emma Kurth (Applied Physics)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
The half-life decay period has said to be a constant, meaning there were no discoverable environmental causes that could affect nor change the time at which an isotope decayed. Several other recent studies on this topic have taken various types of radioactive isotopes into account and experimented on their half-life decay, and how there may be factors affecting the, as of today known "˜constant', decay. The isotope Carbon-14 was one of the radioactive isoptope studied and experimented on, testing whether or not there were certain factors that influenced the decay rate of Carbon-14. Medical dosimetrists work with cancer patients and calculate doses of Carbon-14 appropriate for the specific tumors present, develop high level treatment procedures and use external beam radiation therapy for treatment. Results using a liquid scintillator, show that there are no factors that overly impact the Carbon-14 decay constant, or which would make a dramatic difference for medical dosimetrists.

Anthropogenic Impacts on the Territoriality of the ghost crab, *Ocypode quadrata*, along the Grand Strand, South Carolina (Poster Presentation)
Meredith LaLumia (Marine Science)
Faculty Research Mentor: Eric Rosch, Marine Science

Research has shown that anthropogenic impact can irrevocably change our world's environments, including ecosystems and animal behavior. The Atlantic Ghost Crab, *Ocypode quadrata*, is no exception. This study aims to evaluate how territoriality and aggression levels are influenced by human activity levels. The objective of this research was to assess two beaches, one remote and one more populated, and compare the density and characteristics of crab burrows. The two locations that were utilized in this study were Waties Island, a remote barrier island located in Horry County, South Carolina with private access. The second beach was a public beach access point along Surfside Beach, also located in Horry County. Territoriality presented itself via burrow density and diameter and depths of adjacent burrows. It was hypothesized that ghost crab burrows would be spatially less dense in more frequently visited beaches, and behaviors would tend to be more territorial and aggressive.

An Analysis of recent Coyote (*Canis latrans*) Sightings in the Greater Myrtle Beach Area in South Carolina (Oral Presentation)
Krystal Lamb (Biology)
Faculty Research Mentor: Sharon Gilman, Biology
As urbanization increases, natural areas are being converted into suburban and urban developments. As natural land is converted to suburban neighborhoods, the frequency of interaction between humans and wildlife increases. The greater Myrtle Beach area is experiencing a rapid increase in the level of urbanization, and, in 2018, the frequency of interactions between humans and coyotes became concerning. This resulted in the enactment of a Coyote Response Plan by the City of Myrtle Beach, South Carolina. This plan includes a database where citizens can report coyote sightings online. From February 2019 to February 2021, a total of 180 sightings were entered into this database. The purpose of this study was to analyze these citizen coyote sighting reports to determine where the coyotes are being sighted and whether there are any patterns in the sightings related to land use in the greater Myrtle Beach area in South Carolina.

Enterococci Lurking in Myrtle Beach (Poster Presentation)
Kove Lambert (Engineering Science and Applied Physics)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Salinity is the concentration of salt dissolved in a sample. Conductivity is the ability of an aqueous solution to carry an electrical current. Enterococcus is a group of bacteria that occurs in the intestine of warm-blooded animals. High levels of these parameters indicate fecal and other pollution which can be harmful to human health. The samples were taken between May 2008 - January 2021; 708, 1 and 1013 samples were gathered for salinity, conductivity and enterococcus at WAC-15, Singleton Swash. A Hach CDC401 Conductivity Probe was used to measure salinity and conductivity, an incubator at 35.0 Â± 0.5â˚žC, Fisher Isotemp 600 Series Standard Incubator was the tool used to take and store the enterococcus. Salinity was 33.6 psu which is within the parameters, Conductivity was 23,400 ÂµS/cm which is well above the standards and Enterococcus was in the parameters with 20 MPN/100mL.

Assessing Biodiversity in Sea Turtles using COI Sequence Data (Oral Presentation)
Zachary Lane (Biology)
Faculty Research Mentor: Megan Cevasco, Biology
In this study I phylogenetically examined the mitochondrial locus cytochrome oxidase I (COI) from twenty-six marine turtles using *Crocodylus porosus* for an outgroup comparison. The main purpose of analyzing this locus is to access the utility of COI as an indicator of biodiversity within the family Cheloniidae (Sea Turtles). These analyses expand the number of taxa analyzed in Naro-Maciel et al. 2009, by including ten

additional taxa. These taxa, will help increase phylogenetic resolution and the recognition of biodiversity patterns within sea turtles.

Monitoring Nitrogen Levels at 11th Ave. N Surfside Beach, SC (Poster Presentation)
Kyle LaVoie (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
This research was done to monitor Ammonia, Nitrite, and Nitrate which are measured to assess if they were within safe levels according to the Environmental Protection Association (EPA). Ammonia, Nitrite, and Nitrate are important indicators to the amount of each that could end up in a public water supply. Too much Nitrate can cause excess algae growth in lakes and is unhealthy in large amounts for humans, mainly children. Samples were tested using Ammonia test strips and Nitrite and Nitrate test strips. 242 samples were collected between May 27th, 2010 and January 26th, 2021 at 11th Ave. N Surfside Beach. The mean levels of Ammonia, Nitrite, and Nitrate were 0.042 mg N/L, 0.02 mg N/L, and 0.036 mg N/L respectively. The only compound with an EPA water quality standard is Nitrate and there were only three outliers above the EPA water quality standard of fair (0.1-0.5 mg N/L).

Deep Water Renewal of Loch Etive (Poster Presentation)
Sydney Madden and Brooke Dunnery (Marine Science and Biology)
Faculty Research Mentor: Louis Keiner, Physics and Engineering Sciences/Honors
Loch Etive is a fjord-like sea loch on the west coast of Scotland divided into two basins by the Bonawe Sill. The upper basin of the loch is highly stratified because of freshwater runoff and experiences frequent periods of hypoxia in the deep water. Hypoxia often occurs as a result of respiration, microbial activity, and other processes that deplete oxygen in this isolated deep water. During periods of low rainfall, the stratification is reduced and oceanic water overflows the sill, renewing the deep water. This renewal of the dense, deep water of the upper basin, as seen in the data collected for this study, typically results in major changes in the salinity profile and nutrient distribution of the loch. Aquaculture companies choose placements of trout and mussel farms based on salinity considerations. Understanding of the renewal events is crucial to the economic success of the local community.

Similarities in SLITRK Gene Mutations and the Development of Neurological Disorders (Poster Presentation)
Brittney Mazen (Biology)
Faculty Research Mentor: Megan Cevasco, Biology
The SLITRK genes code for transmembrane proteins that modulate neurite outgrowth. Mutations in these genes cause a variety of neurological disorders. To better understand the different expressions of the SLITRK genes and the similarities that link each gene together, six differences in the gene mutations are compared using multiple phylogenetic optimality criteria in two taxa (Homo sapiens and Rattus norvegicus). This project analyzes the link between each of the different SLITRK gene mutations and the devolvement of neurological disorders. Finding a link between the different gene mutations can help to better understand the mutations and assist in the development of future treatments.

How Media Literacy Lessons in South Carolina Schools Can Reduce Negative Side Effects of Internet Platforms (Oral Presentation)
Sarah McGonigle (Political Science)
Faculty Research Mentor: Michael Promisel and Jacqueline Kurlowski, Politics
Reasons for the deep political division, driving unrest in the U.S., are social media addiction and misinformation online. Perhaps the biggest victims of this are teenagers, as they are the largest target

audience for the technology industry. In order to combat the negative consequences of this reality, I have studied media literacy lessons in public school curriculums along with their best practices throughout the U.S. I created a piece of public policy to implement lessons on media literacy to teach South Carolina middle and high schoolers about the threat of social media and the tech industry, along with how to effectively avoid the multitude of adverse outcomes through advancing critical thinking skills in everyday online use.

The Balance between National Security and Civil Liberties: Protecting Citizens' Privacy in the Face of the Rising Threat of Domestic Terrorism (Oral Presentation)
Holly McGrath (Intelligence & National Security Studies and Psychology)
Faculty Research Mentors: Richard Kilroy and Jacqueline Kurlowski, Politics
When the United States faces an elevated security threat, executive orders and sunset policies are passed that allow for intelligence collection methods that infringe upon civil liberties granted in the U.S. Constitution. In a comparison of policies enacted during different administrations from the Civil War to post 9/11, it can be concluded that policies implemented during war time tend to target specific groups, infringe upon the civil liberties of the group, and are justified by a security threat. This paper addresses the need for new policies to put in place a system of checks and balances to allow intelligence collection on U.S. citizens in response to the rising threat of domestic terrorism while still respecting civil liberties.

Novel Micro-Plastics Extraction Line: Elutriation, Chemical Digestion, and Density Separation (Poster Presentation)
Nicole McHugh and Daniel O'Hara (Marine Science)
Faculty Research Mentor: Till Hanebuth, Marine Science
Microplastics have previously been studied mainly with a focus on beach sands. Little research suggests how to quantify microplastics in highly cohesive, organic-rich, heterogeneous sediment samples from tidal wetlands and marsh systems. Our research goal is to develop and optimize a 3-step microplastic separation line using elutriation, chemical digestion, and density separation. Elutriation uses turbulent flow to physically suspend sediment and separate plastics. Sieves are used to filter outflowing material and collect these microplastics. Chemical treatment is optimized for a fully controlled, mild, yet effective digestion of plant matter. A density separation is refined with saltwater and ZnCl2 solutions of variable densities to further separate plastics and remove the lithic components. Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscope (SEM) and automated microscopy counting techniques are utilized as a final analytical step for the classification and quantification of the compositional types, shapes, sizes, and preservation stages of the separated microplastics.

Gender Biases in Jury Decision Making (Poster Presentation)
Sidney McLaughlin (Psychology)
Faculty Research Mentor: Marlena Ryba, Psychology
Several factors have been found to impact jury decision-making in death penalty cases. Previous research indicates that a defendant's gender can influence jury decisions. The present study will examine the jury's potential biases by jury decisions in cases of men versus women defendants. Participants will be presented with detailed case information pertaining to a crime. Participants will be randomly assigned to either the man or woman defendant scenario and asked to determine if the punishment of death fits the crime. A t-test will be used to compare group differences. This study is important because it shed light on gender biases within our prison systems.

Briarcliffe Acres, Mouth of Swash: Monitoring E. Coli, Enterococci (Poster Presentation)
Tyrone Mitchell (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Enterococci is an indicator bacteria that is used to measure the presence of fecal contamination in marine and fresh water. Water quality monitoring is important to safeguard public and ecosystem health. For this research forty-six samples were collected from Mouth of Swash, Briarcliffe Acres, in South Carolina from February 20, 2018 to February 17, 2021. The samples were analyzed using IDEXX EnterolertTM-Quanty-TrayTMMethod (SM 9230D-2007). The mean result was 384 cfu/100mL, which is within the water quality standard of 104 "“ 501 cfu/100mL for single samples proposed by the EPA.

Microfluidic Microplastic Separation (Poster Presentation)
Grant Mitchell (Applied Physics)
Faculty Research Mentor: George Hitt, Physics and Engineering Science
It's no secret: microplastics are everywhere. Currently, sieves and sifters are unable to filter microplastics smaller than 63 mocrpmeters, slightly smaller than the diameter of a human hair, out of sediment. Intuition would say microplastic in the environment is a bad thing, but that is just the problem" ”we don't know. Samples of microplastics smaller than 63 micrometers that are large enough to conduct biological and chemical analysis on have not yet been accumulated from sediment.
In this research study, we are using microfluidic chips to investigate ways to passively sort microplastic types, in an effort to collect a large enough sample of microplastics so that proper scientific analysis can be performed. The microfluidic chips are devices made of fluid carrying channels, designed and fabricated using techniques borrowed from the semiconductor industry. We are exploring implementing various passive separation and sorting functions to apply to microplastic assay.

Montessori Education: Teaching Self-Regulation through Virtual Instruction (Oral Presentation)
Brooke Myers (Early Childhood Education)
Faculty Research Mentor: Cathy Scott, Founcations, Curriculum and Instruction
One of the hallmarks of a Montessori education is the development of children's social and emotional regulation skills. However, what happens when the Montessori curriculum is interrupted due to the onset of COVID-19? Does the transition to online learning impact student opportunities for social and emotional self-regulation? This case study attempts to examine the ways in which a school's four lower and upper elementary Montessori teachers adjust their instruction to meet student needs online, and the benefits and challenges they experienced as a result. Findings are shared, as well as implications for those engaged in virtual instruction of K-6 students.

Regulatory RNA structure in Streptococcus pyogenes: Terminator of streptolysin S associated gene A (Oral Presentation)
Sara Nibar (Biochemistry)
Faculty Research Mentors: Brian Lee and Gabriela Perez-Alvarado, Chemistry
Streptococcus pyogenes, also known as group A *Streptococcus* (GAS) is associated with necrotizing fasciitis. The host immune response to this disease is inhibited by the exotoxin streptolysin S (SLS), which is encoded by the *sagA* gene. Disruption of the rho-independent terminator of the *sagA* gene leads to transcription of the gill sag operon and releases SLS. The programs mfold and RNAfold were used to predict secondary structures of the terminator region. RNA transcripts were generated by the *in vitro* transcription. Differential scanning fluorimetry was used to characterize the secondary structure of the terminator RNA and to select optimal conditions for 3D structure determination by X-ray crystallography. Three-dimensional homology models of the structural motifs within each construct were predicted using

the FARFAR program within Rosetta. Determining the structure and interactions of the saga terminator will add for the development of therapeutics that can decrease SLS expression.

Isolated Point Discharges into Coastal Swashes as Nutrient Sources to Coastal Waters (Oral Presentation)
Mary Olsen (Marine Science)
Faculty Research Mentor: Angelos Hannides, Marine Science
Coastal water quality in the Grand Strand of South Carolina is directly influenced by human activities. Nutrient-rich runoff, stemming from numerous anthropogenic sources, finds its way into coastal waters through freshwater inputs often through tidal creeks termed swashes. In order to better describe the amount of nutrient inputs into Singleton Swash and White Point Swash, we examine the various sources of anthropogenic runoff from isolated identifiable point discharges and their nutrient concentrations, as those compare to annual patterns where available. We report concentrations of dissolved inorganic nitrogen (DIN, as the sum of nitrate, nitrite and ammonium) and phosphate in discharge and creek water. We hypothesize that nutrient concentrations of isolated, minor point discharges are not significant enough to alter primary channel chemistry due to rapid flow rates, and suggest that non-point sources may play a larger role in nutrient loading in the coastal zone.

Virtually or In the Classroom? Elementary Students'; Preference for Learning Environment and the Implications on Their Academic Performance (Oral Presentation)
Ashley Perkins (Elementary Education)
Faculty Research Mentor: Richard Costner, Foundations, Curriculum and Instruction
The coronavirus has affected every one of us in some way or another. Elementary students have had to attend school in several configurations including: Full-time virtually (at home); hybrid, and in the classroom itself. In this study, elementary students responded to a survey which asked them, among other things, to identify whether they preferred learning virtually, or in the classroom. Questions on the survey included: Do you prefer learning virtually or in person? Do you think you learn better virtually or in person? Another survey was administrated to determine the teachers' general assessment of the students'; performance in both environments. The teacher survey included questions such as: What was the average test score while students were learning virtually? What was the average test score while students were in person? Analysis of the survey data provides insight on which environment elementary students prefer and the environment in which they perform best.

Student Survival: Sleep and Social Parameters During a Pandemic (Poster Presentation)
Adonya Pertell (Psychology and Sociology)
Faculty Research Mentor: Marlena Ryba, Psychology
While technology has many benefits (e.g., more connections), research suggests that prolonged use of technology may have adverse effects on mental and physical health. Given the increased use of technology during the COVID-19 pandemic, it is important to examine the effects of technology use, particularly among students engaged in virtual learning. This study will examine the relationship between time spent engaging in virtual learning, levels of social support, and sleep. Using a self-report assessment of time spent engaged in virtual learning (hours), the Social Network Index, and the Pittsburgh Sleep Quality Index, a multiple regression analysis will be used to analysis data from a sample of college students to investigate whether the amount of time spent on virtual learning and social support predict participants' sleep quality. It is hypothesized that sleep quality is affected by both the amount of time spent virtual learning and social support received.

Detection of Tomato Mosaic Virus Using a Novel at Home RT-PCR Approach (Oral Presentation)
Kaylee Petraccione, Emma Lehmann, and Molly Tancini (Biology)
Faculty Research Mentor: Michelle Barthet, Biology
Tomato mosaic virus (ToMV) belongs to the genus Tobamovirus consisting of positive-strand RNA viruses. ToMV has limited tomato production globally. Current testing methods require expensive molecular equipment for high complexity molecular diagnostics and are limited to a laboratory environment. Novel ToMV primers targeted against ToMV genes 2 and 4 were created for detection of ToMV in tomato leaves and were checked by BLAST analysis in GenBank for non-specificity to other viruses. A modified RNA extraction protocol and a simplified RT-PCR protocol with SYBR green was used to amplify and detect ToMV in a manner for replication in a kitchen environment. An internal control was incorporated to confirm positive results and successful RNA extraction. Initial tests demonstrated the efficacy of the methodology. This RNA extraction and RT-PCR approach will help detect ToMV outside of the laboratory and lead to detection methods for various viruses when materials and facilities are lacking.

Synthesis and Phase Diagram Investigation of Spinel Vanadates (Oral Presentation)
Benjamin Pfingstler (Applied Physics)
Faculty Research Mentor: Scott Carr, Physics and Engineering Science
Spinel vanadate systems, AV2O4, display a wide range of physical characteristics from magnetic, structural, and electronic frustration, to heavy fermion behavior. These materials, which are primarily ceramics, contain differing phenomena based upon which element occupies the A-site. Our focus is on A = Li, Zn, and Al. The vanadium valence changes from 3.5+ to 2.5+ through the shift of Li to Al, and we are interested in whether or not this transition is continuous or if other phenomena will present themselves when delving into the transition regions. Vanadium valence drives the physics of these compounds meaning that having a complete map of valence based physical phenomena can lead to a better understanding of these compounds. Our goal is to synthesize Al(1-x)Zn(x)V2O4, measure its magnetic, structural, and electronic properties, map out the phase diagram, and if possible delve deeper into the low temperature physics of AlV2O4.

How does Salinity Affects Our Economy Rivers and Species? (Poster Presentation)
Jaquan Reed (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
The term salinity refers to the concentrations of salts in water or soils. Among other factors, many studies have reported an influence of water salinity on fish development and growth. In this research study, 293 salinity samples were analyzed using instrument Hach HQ40d Multi-Meter between September 28, 2010 and September 25, 2018 at Murrells Inlet Oyster Beach in South Carolina. Samples were stored in sealed containers at 4Â°C and analyzed within 28 days of collection. The mean salinity was 34 and ranged from 24.7 - 36.9 ("°).

The War on Addiction: Incarceration vs Rehabilitation During the Opioid Epidemic (Oral Presentation)
Caitlin Rhodes (Political Science and Communication)
Faculty Research Mentors: Aneilya Barnes and Kaitlin Sidorsky, History and Politics
The opioid epidemic in the United States has been devastating, claiming over 500,000 lives since 1999. Attitudes toward addiction and how it is handled in the legislative, criminal justice, and health systems continue to evolve, with states adopting a range of policies on substance abuse. In 2020, Oregon decriminalized all drugs, prioritizing rehabilitation over punitive efforts. This research compares the results of Oregon's rehabilitation policies governing opioid use disorder to those of the incarceration-centered policies that Illinois has adopted. Through an examination of legislation, incarceration statistics,

overdose rates, and budget reforms regarding rehabilitation and imprisonment for each state, this paper will demonstrate that incarceration is a punitive measure for those struggling with opioid addiction and only serves to further perpetuate its cycle.

Billie Eilish and VR: Music Preferences and Environmental Influences (Poster Presentation)
Brett Richardson (Psychology)
Faculty Research Mentor: Terry Pettijohn II, Psychology
It is a warm, sunny day and you are driving home from work, what music might you play in this situation? How does that differ from a dark and rainy evening? Previous research has established there is a seasonal effect on music preferences (Pettijohn, et al., 2010). This study sought to further assess environmental influences on music preferences via an experimental approach, in which participants were placed in a virtual reality (VR) that simulated either a natural or unnatural environment. While experiencing this VR environment, participants listened to a slow song and a more upbeat song consecutively by the same artist (Billie Eilish), and rated which song better fit their virtual environment. The study found that participants in the natural environment simulation were significantly more likely to select the slower song, while participants in the unnatural environment simulation said that the upbeat song fit better in their environment.

"Street shop" Culture: Analyzing a Southern Tattoo Shop's Artists (Oral Presentation)
S. Bryce Ross (Communication)
Faculty Research Mentor: Deborah Breede, Communications, Media and Culture
This study analyzes the communication, culture, and gender performances within a tattoo shop in the southeastern United States. In this ethnographic research of a specific tattoo shop, a unique culture presents itself, characterizing verbal and nonverbal communication with "shop talk,"□ masculinized performance, and an undefined "speech code"□ (Philipsen). This study also is also underpinned by a global pandemic, the origins of which have become increasingly politicized, something that can be used as a scope through which to analyze communication.

Tracking Microplastics throughout a Beach Renourishment Project on Pawley's Island, South Carolina (Poster Presentation)
Madeline Rothwell (Marine Science)
Faculty Research Mentor: Eric Rosch, Marine Science
There is growing evidence of the prevalence of microplastics in nearly all environments, including beaches. Despite beaches being valuable locations for tourism, recreation, and natural habitats, very little is currently known about the level of microplastics within them, especially during renourishment. The beach renourishment project on Pawley's Island, SC took place from October 2019 to March 2020. Sand samples were taken from the north end of the island in three locations along the beach from the foreshore, backshore, and dunes at predetermined distances from the nearest major structure (a pier). Prior to renourishment, distance from the pier had an impact on microplastic concentrations as well as beach zone with higher levels in the foreshore areas. With the completion of the renourishment project in March 2020, data will be analyzed to determine how the project has affected microplastic concentrations both spatially and temporally.

Measuring Biochemical Oxygen Demand in Crabtree Swamp in Conway SC (Poster Presentation)
Allen Ruff (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science

Biochemical Oxygen Demand (BOD) is extremely important to measuring whether or not an ecosystem is working well. BOD is the measurement of dissolved oxygen (DO) in water that is required for organisms to decompose organic matter. The body of water that was examined was the Crabtree Swamp located in Conway South Carolina. 345 samples were collected between January 31, 2008 to December 17, 2020. The results range from 0.77 mg DO/L to 14.92 mg DO/L with an average of 2.10 mg DO/L. The range has figures that are over the range of moderately polluted water system. Per Science Direct, the level for a moderately polluted water system ranges between 2 mg DO/L and 8 mg DO/L.

The Role of Radiation on Martian Dust Storms (Oral Presentation
Tanner Saussaman (Applied Physics)
Faculty Research Mentor: George Hitt and Roi Gurka, *Physics and Engineering Science*
Dust storms on Mars can last for months at a time and can reach peak speeds of 30 m/s. However, considering Mars's incredibly thin atmosphere, these storms should be significantly slower, if at all. We hypothesize that the triboelectric effect, friction-based electrification, in conjunction with the large levels of radiation, due to Mars thin atmosphere and lack of a magnetic field, may generate lift force upon Martian dust to produce such large storms. The triboelectric effect has been shown to cause sparks when shaking dust in a low-pressured environment, and radiation has shown its potential to cause lift; an example, a gold leaf lifting once exposed to x-rays. The aim of this research is to thoroughly investigate this phenomenon and examine the possible connection of both radiation and triboelectric effects may have on Martian dust storms.

The Effect of Post-Event Information on Recognition and Confidence (Oral Presentation)
Emily Scott (Psychology)
Faculty Research Mentor: Matthew Murphy, Psychology
The purpose of this study was to investigate the effect of misleading post-event information (PEI) on recognition and confidence. Memory is often altered due to the effects of PEI, and because confidence is used as an indicator of memory accuracy, it is important to test if confidence is positively correlated to accuracy. Participants viewed a slideshow simulating an actor stealing multiple items in a store, and then read a narrative which included misleading, neutral, and confirming PEI about the events in the slideshow. Participants completed a forced choice memory task, and were asked to rate their confidence in the accuracy of their answers. Confirming PEI caused both accuracy and confidence scores within sequence A to increase, and misleading PEI caused accuracy scores in sequence B to decrease. There was no effect of PEI on confidence in sequence B. Five out of six Pearson's r correlations showed a positive significant correlation between confidence and accuracy, suggesting that confidence is a predictor of accuracy. This particular subject has implications as it relates to the validity of the Manson Criteria, specifically criteria's #3 (accuracy), and #5 (confidence).

A Case Study Comparison of Coal Fired CCUS Plants in the United States and China (Oral Presentation)
Margaret Shoop (Marine Science, Political Science, and Language and Intercultural Studies)
Faculty Research Mentor: Adam Chamberlain, Politics
A critical emerging technological process to help reduce anthropocentric carbon emissions is Carbon Capture Utilization and Sequestration (CCUS), whereby carbon dioxide emissions are captured from the flue gas expelled by coal-fired power plants. Nations, especially the United States and China, are working to develop and advance CCUS programs. Yet, existing research does not explain how external factors impact the development of CCUS programs in either country. In this paper, a comparative study of five plants (three in the United States and two in China) is used to evaluate how funding, regulation, and information sharing and collaborative networks affect the development of CCUS programs. I find that the development of CCUS in the United States is impacted by insufficient funding and regulation, and in China,

CCUS development is constrained by inconsistent sources of funding, limited regulation, and minimal international collaborative networks. Overall, these results suggest that further collaboration between the United States and China could resolve issues that bar the successful development of CCUS.

Poetry, Politics, and Social Justice: The Role of Creative Writing in a Post-Trump America (Oral Presentation)
Sage Short (English)
Faculty Research Mentor: Christian Smith, English
Creative writing has always been important to me, and over the years of writing and studying it, I have learned that poetry is political. Poetry, like all creative work, is ever changing; literary periods are constructed out of historical, social, and political contexts. Looking forward into a post-Trump America, a new age of poetry will surely emerge. In the face of renewed public conversations highlighting fascism, white supremacy, and other forms of marginalization, poetry becomes essential for survival in many communities and across identities. When the world around us seems to be falling apart, we turn to poetry. The poets I discuss here are Maya Angelou, Allen Ginsberg, Audre Lorde, and Adrienne Rich" ”famous poets who used their inherently political, personal lives in their work to bring about social change. Each poet's work reflects their narratives, offering a place for other marginalized individuals under the guise of oppression in America.

Salinity of the Mouth of Swash in Briarcliffe Acres (Poster Presentation)
Jhamarcus Smith (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Salinity is the measure of the salt dissolved in a body of water. Salinity is conveyed in parts per thousand (ppt) or percentage ("°). Salinity of a body of water proves to be vital because salts can be toxic to the environment in terms of being in water. Water that is too polluted with salt may not be drinkable and usable in many ways for the people in the area in question. In this research a total of 45 samples of environment quality lab salinity were taken from February 20, 2019 to February 17, 2021 in the mouth of swash in Briarcliffe Acres, South Carolina. Salinity was measured using Hach CDC401 Conductivity Probe. The mean of data was 26.2"° and ranged from 2.9"°-39.7"°, which is out of the normal range.

Reflections on van Eyck: The Meaning of Mirrors in Portraiture (Oral Presentation)
Jenna Smith (Art Studio and Graphic Design)
Faculty Research Mentors: Aneilya Barnes and Stephanie Miller, History and Visual Arts
Mirrors in paintings have many connotations. Mirrors can extend the pictorial space, reveal hidden imagery, represent social and cultural value, or function symbolically. This project focuses on the convex mirror in Jan van Eyck's *The Arnolfini Portrait* (1434) and considers its influence on Diego Velázquez's *Las Meninas* (1656). Van Eyck places the mirror centrally in the composition, showing his reflection below the unusual display of a signature on the wall and inviting interpretation and comparison between the portrait and mirror. Over two centuries later, van Eyck's innovations, including the mirror motif, inspired Velázquez's inclusion of a central mirror next to a self-portrait. This research examines the significance of mirrors in van Eyck's and Velázquez's portraits, situating them within the context of other paintings with mirrors created between 1434 and 1656, to help determine their broader appeal.

Eavesdropping on fishes reveals alterations in the soundscape across tidal creeks (Poster Presentation)
Abigail Solarz (Marine Science)
*Faculty Research Mentor: Cecilia Krahforst, Marine Scienc*e
Ecoasoustic measurements of soniferous species can help researchers understand environmental change across time. Baseline data were collected in seven tidal creeks around Baruch Marine Lab. In Raven Lite 2021 Undergraduate Research Competition

2.0, anthrophony and geophony sounds were removed leaving primarily biophonoy sounds. These edited files were processed through R Studio to find acoustic entropy, acoustic diversity, and the acoustic complexity index for each site. Preliminary data suggests that each acoustic index is highly variable across tidal creeks and is related to the soundscape players. Further exploration of these tidal creeks over time suggests that the soundscape varies with water quality, resulting in the highest acoustic activity coinciding with higher salinities. This suggests that the soundscape is tied to water quality at a site, especially salinity. Monitoring acoustic environments across time can provide proxy measurements for environmental change in estuaries.

Strontium-90 Radioactivity Variation with Earth-Sun Distance Resulting in Severe Nuclear Accidents (Poster Presentation)
Jessica Solomon (Engineering Science)
Faculty Research Mentor: George Hitt, Physics and Engineering Science
Strontium-90 is the most common radioactive man-made isotope. It is much like calcium in that it relates closely to the bone and teeth. Exposure to Strontium-90 radiation can increase cancer rates in the bone or may result in the needed removal of an area. The danger is the isotope's half-life of 28.9 years meaning an increase in radiation. Two Geiger Muller (GM) detector systems consisted of NATS-1510/1520g tube connected to a NATS-EDUC-1510 single-channel analyzer were used in detecting Sr-90 radiation level. The radioactive sources used for these detectors were 0.09270.018 mCi of Sr-90. The Sr-90 detector system had a plateau spanning 850-1150 V with a slope of 13.5% change in counts per 100 V and a dead-time constant of 0.61. The results showed a clear correlation between room temperature and normalized count rate. The GM exhibited a positive correlation coefficient with temperature which was expected.

Water Quality monitoring for Salinity and Enterococcus in Surfside Beach (Poster Presentation)
Devonta Stanley (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
The Surfside area of Myrtle Beach, SC on 16th Avenue North was tested for salinity and bacteria level of enterococcus. Salinity is the concentration of salts in water and enterococcus is an indicator of fecal matter contamination. These two indicators are part of South Carolina and federal laws in order to prevent potential impacts of poor water quality. High salinity and enterococcus concentrations within stormwater areas can be an indicator that there needs to be improvements to water quality standards and impact the health of humans and the environment. Salinity used Hach CDC401Conductivity Probe and enterococcus used IDEXX 97-well Quanti-Trays with a reagent, enterolert, between May 8th, 1997, and January 25, 2021. 700 and 396 samples were collected for enterococcus and salinity resulting in averages of 106MPN/mL and 33.9PSU respectively. These results were below SCDHEC and EPA standards.

How Sonar may not be the only means for Detecting Nuclear Submarines (Poster Presentation)
Zachary Stevens (Applied Physics and Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Nuclear submarines may be able to avoid sonar but not neutrino detection. The first conducted experiment uses the detection of neutrinos from a decaying isotope of Manganese-54 using a NaI detector which uses scintillation to produce a flash of light when a neutrino is detected inside the detector at varying temperatures. The second experiment detects neutrinos coming from a large nuclear reactor which is similar to a nuclear missile on a submarine. Nuclear weapons release an abundance of neutrinos from the decay of the radioactive material inside them. Over the course of approximately one month, as the temperature measured around the detectors increased to over 22 degrees Celsius the detected neutrinos count dropped below the standard 10 to the seventh power. These experiments

show that the release of these particles in a sub nautical area below 20 degrees Celsius are a better means of detection when looking for nuclear submarines.

Examining the Impact of the COVID-19 Pandemic on Intimate Partner Violence (Oral Presentation)
Casey Sullivan and Alyssa Simpson (Sociology)
Faculty Research Mentor: Sharon Thompson, Health Sciences
Intimate partner violence (IPV) is a problem that impacts 1 in 4 women and 1 in 10 men throughout their lifetime in the United States. The COVID-19 pandemic brought high rates of unemployment and extensive stay-at-home orders that negatively impact the lives of people. South Carolina falls in the top 5 states for reported IPV incidents, so rates of physical violence, sexual violence, stalking, or psychological harm are likely higher than the national average. This research was conducted to assess IPV experiences and the impacts of the COVID-19 pandemic on IPV stressors and social support. A survey was devised in both online and paper-pencil formats to determine participants' experiences with IPV during the pandemic. Questions were also developed to determine residents' knowledge of intimate partner violence and local IPV resources to establish where education and advocacy efforts are needed in our community. Results will be discussed.

Perceived Stress Levels and Bacteriophage Presence on the Campus of Coastal Carolina University (Poster Presentation)
Korinne Swanson (Biochemistry)
Faculty Research Mentor: Paul Richardson, Biochemistry
Approximately 2.8 million people each year are diagnosed with an antibiotic resistant bacterial infection, and more than 35,000 of those diagnosed die. In the 1920s, there was a surge in use of antibiotics to treat all bacterial infections. However, in 1947, penicillin resistance was observed and it was found that bacteria was rapidly evolving to evade antibiotics. Since this discovery scientists have been trying to discover innovative ways to treat antibiotic resistant bacterial infections, such as bacteriophage. Bacteriophage are naturally occurring viruses that are non-pathogenic to humans, whose hosts are bacteria. The isolation and characterization of bacteriophage will one day allow for the natural sourcing of bacteriophage, which can be used to fight antibiotic resistant bacterial infections like Methicillin Resistant Staphylococcus Aureus (MRSA). The purposes of this study was to isolate and characterize Staphylococcus and Escherichia bacteriophages and to determine possible correlations between the presence of bacteriophage on a human and their perceived stress level. Samples were collected from the nose and ears of students and faculty at CCU each month. The samples were then subjected to plaque assays and PCR to determine the presence of bacteriophage. Participants were also instructed to take a subjective stress survey to determine if there was a correlation between stress levels and bacteriophage population. Each sample was then run through a series of microbial and molecular tests to screen for the presence of bacteriophage. These results were correlated with the stress surveys to indicate any relationships that exist between phage presence and stress.

A Research Study of the Correlation between Student Self-Advocacy and Postsecondary Success (Poster Presentation)
Kaleigh Tarabek (Special Education)
Faculty Research Mentor: Rhonda Miller, Foundations, Curriculum and Instruction
My project will be a replication of a study previously done, "Self-Advocacy Instruction to Teach High School Seniors With Mild Disabilities to Access Accommodations in College". This research was done by Debra G. Holzberg, PhD, David W. Test, PhD, and Dana E. Rusher, MA. The study was implemented to examine "the

effects of Self-Advocacy and Conflict Resolution instruction on the ability of four high school seniors with mild disabilities" (Holzberg, D. and Rusher, D. 2019). I will be compiling student data using the same surveys used in the above study. I will reflect and analyze survey responses as my sample size and student demographics will be different. Replicating the other factors in this study will allow for reliable, valid, and standardized data.

Alkalinity on the Waccamaw River at Murrells Landing (Poster Presentation)
Jacob Teramo (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Alkalinity measures water's ability to neutralize acids to stay at a stable pH level. The alkalinity is changed based on the number of carbonates in the water, and these carbonates come from runoff over rocks. The fish, plants and even the ecosystems that feed from the water all rely on alkalinity to keep them safe. A pH higher than 8.0 will begin to cause the most common aquatic organism to die. Between June 06, 2006 to Feb 24, 2021. 2579 samples were collected from the Waccamaw River at Murrells Landing in Conway, SC. Alkalinity was measured using the Method 4500-H+ B of standard methods. Alkalinity averaged at 7.72mg CaCO3/L which is well below the high point of 20mg CaCO3/L, and pH remained within the standard at an average of 6.

"Homeward Bound," From "Aurora - Suite for Orchestra" Op. 7 (Oral Presentation)
Ethan Toavs (Music)
Faculty Research Mentor: Donald Sloan, Music
This project is an original music composition for symphony orchestra. “Aurora – Suite for Orchestra” is a musical depiction of a fantasy world as seen through the eyes of a child. “Homeward Bound” is the last of eight movements of this suite and is spiritually summative of the suite as a whole. It is a cumulative work representing my work with music composition, harmony, orchestration, and formal designs. Additionally, it demonstrates my use of modern music technology, in this case creating a virtual simulation of a live orchestra—one which the average listener may find indistinguishable from an actual recording of a live orchestra. Since there is not enough time to present the entire suite, I will briefly explain the nature of the piece, the simulation of the live orchestra, and then play the piece.

Turbidity Monitoring at Coastal Carolina University (Poster Presentation)
Nikita Tolbert (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Turbidity is a measurement that monitors how clear, cloudy, or opaque the water is in relation to micro and macro suspended matter that can sometimes be harmful to humans. TDS represents the number of dissolved particles in a volume of water, measured in mg/L. These materials can range from dirt, animal and sea life decay, and even fecal matter. If turbidity and TDS were not monitored and treated regularly, then our daily water use would be contaminated, making us vulnerable to illness. The stormwater quality monitoring program on Coastal Carolina University’s campus collected 717 samples from the Wall Pond Bridge site and tested for turbidity and TDS biweekly between Oct 13, 2011 and Nov 16, 2020. The average turbidity results were 4.5 NTU which were and are above the standard, which is 4.0 NTU for the EPA, but were in compliance with the S.C. DHEC standard of 50 NTU. Keywords: Wall Pond Bridge; Suspended matter; Stormwater quality monitoring; NTU; EPA; S.C. DHEC

Music Therapy and Mental Health (Oral Presentation)
Sydney Vogel (Music and Communication)
Faculty Research Mentor: Eric Crawford, Music

Music therapy is an approach that is effective in treating individuals suffering from a variety of mental illnesses that are genetic or environmental. Some of these mental issues include, autism, attention deficit hyperactivity, clinical depression and anxiety, bipolar disorder, and schizophrenia. In my oral presentation, I will discuss the effectiveness of music therapy in comparison to the use of traditional medication. First, I will discuss the positive and negative effects of standard medicinal approaches on those suffering from anxiety and depression and offer evidence, through several music therapy studies, of effective musical interventions. Second, I will show the results of my survey of the stress levels among Coastal Carolina University music majors. I will compare this data to results from Patrick Donlinic's thesis "How Effective is Music at dealing with Anxiety and Depression?"□ to determine the inherent ability of music to positively impact mental health.

The Padme Amidala Effect (Oral Presentation)
Mackenzie Volpert (Theatre Arts)
Faculty Research Mentors: Aneilya Barnes and Kevin Ferguson, History and Theatre
Since its debut in 1977, the Star Wars universe has reshaped the world of fantasy, creating a new template for the modern film and setting a standard for world-building and characters alike. Girls strive to emulate their female heroes from these movies, but a close examination reveals them to be poor feminist icons and stereotypically weak characters. Women receive a fraction of the screen time of their male counterparts, hold little agency over the plot of the movie, and a lack of female perspective results in stunted character development and egregious male saviorism. Even in fantasy realms, girls are taught that the patriarchy reigns supreme. Using the women of the Skywalker Saga, this project will illustrate why they are insufficient role models and develop a guideline for equality in fantasy films.

Inherent Racism of the D.A.R.E. Program (Oral Presentation)
Megan Walter (History)
Faculty Research Mentors: Aneilya Barnes and Kevin Ferguson, History and Theatre
The Drug Abuse Resistance Education Act (D.A.R.E.) was created to curtail rampant drug, alcohol, and tobacco use among teens as well as improve community and officer relationships. The program was implemented in schools across the U.S. with the Reagan administration's "War on Drugs," a zero-tolerance policy enacted to produce conformity within the educational system and produce better citizens. D.A.R.E. has been proven to be ineffectual in long-term curtailment of drug, alcohol, and tobacco use and aided in disproportionately criminalizing Black and Latino communities. By examining leading individuals' involvement in the creation of the program and conducting a case study on D.A.R.E. funding and implementation in Columbia schools, this research will show the inherently racist nature of the program and the failure of D.A.R.E.'s racial equity statement.

Monitoring Chlorophyll / Pheophytin in Waccamaw River (Oral Presentation)
Jade Washington (Engineering Science and Information Systems)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
In small bodies of water such as ponds, rivers and lakes have significant influences with biological diversity and networking within the landscape. For oxbow, the role of a natural linker between similar areas within the landscape plays the river. Chlorophyll is a green substance that appears in green plants and cyanobacteria which is also good for absorption of light for providing energy for photosynthesis. This molecule can hold a magnesium atom that is held in a porphyrin ring. It can also determine primary production and photosynthesis. They are also essential molecules that are responsible for harvesting solar energy in photosynthetic antenna systems, and for the charge separation and electron transport within reaction centers. The difference between chlorophyll and pheophytin is that Pheophytin is a grey pigment

related to Chlorophyll, with the difference that its Porphyrin ring does not have Magnesium ion in the center, but two different protons instead.

Absorbance at the Crabtree (Poster Presentation)
Jacquon A. Williams (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Water scarcity is a growing concern across the world in this document we investigate Crabtree swamp, that's in Conway, SC. Water absorption is the amount of water taken up by flour to achieve the desired consistency and create a quality end-product. Yet, in this case, we're talking about the Crabtree swamp land area. The goal of this research project is to compare and contrastwater absorbance in the area. The purpose of this study is to naturalize the aquatic ecosystem processes in Crabtree Swamp and improve the survivability of resources of regional significance that have been identified. Resources such as trees and water levels provide adaptable conditions for wildlife in the Crabtree swamp area.

E.coli and Total Colifo
Emilio Wilson (Engineering Science)
F*aculty Research Mentor: Monica Gray, Physics and Engineering Science*
Water is important because we use it for our everyday use, whether it's for drinking, bathing, or for our enjoyment. Pollution causes the environment to have a harmful effect, which is usually caused by microorganisms (bacteria) Some of those Bacteria's include E. coli and Total Coliform. They're mainly found in the intestines of humans, in animals, in water, and also found in the soil. Most of these bacteria are harmless but it can provide you with symptoms of diarrhea, vomiting, and stomach cramps. When water comes in contact with feces, humans, or any living organism, the water is contaminated. There was a total of 256 samples of E. Coli and Total Coliform that was measured in CFU/100 mL (Colony Forming Unit). Samples came from the 544 West location at Coastal Carolina University. From 2011-2020 the number of E. Coli and Total Coliform increased compared to the standards and averages.

Gauging the Turbidity and Conductivity of Water in the Crabtree Swamp (Poster Presentation)
Ryan Yeoman (Engineering Science)
Faculty Research Mentor: Monica Gray, Physics and Engineering Science
Turbidity measures the relative clarity of water. The higher the turbidity would cause an increase in the temperature of the water and also could prevent photosynthesis from occurring. Conductivity measures the ability of an electrical current to pass through a sample of water. Higher conductivity means that there are more chemicals dissolved in the water. We conducted our experiments from Jan 31st, 2008 to Dec 17th, 2020. For our research, we used a nephelometer, a multimeter, and a glass beaker to store the water in. We conducted the experiments in Crabtree Swamp, which is a swamp that is in central Conway, South Carolina. We had a conductivity average of 195 µS/cm, and an average value for turbidity of 12.4 NTU.