



Science Center for Marine Fisheries Supports Research Opportunities for Students

July 18, 2023 – The Science Center for Marine Fisheries (SCEMFIS) was founded to bring together industry and academia to support cutting-edge finfish and shellfish research. A critical element of this mission is to support the careers of students and up-and-coming scientists by actively involving them in Center-funded projects. That is why SCEMFIS member institutions are proud to provide research opportunities as part of the National Science Foundation’s Research Experiences for Undergraduates (REU) program.

The REU program allows students to participate directly in scientific research at the undergraduate level. This gives them valuable hands-on experience in the lab and in the field, lets them contribute to published studies, and helps lay the foundation for a future career in marine science. Many of our students who have successfully completed projects in the REU program have gone on to further their careers in academia and fisheries science and management.

SCEMFIS REU students have been integral in recent projects funded by the Center, conducting research on a range of topics, including geospatial analysis of cod spawning and how it is affected by climate change; the economic feasibility of Atlantic surfclam hatcheries; how potential offshore wind developments interact with existing ocean geography and nearby ocean species; improving clam dredge designs; the importance of forage fish in marine food webs, and research into the life history and population dynamics of surfclams and ocean quahogs.

The REU program has students at many SCEMFIS member institutions, including the University of Southern Mississippi, the Virginia Institute of Marine Science at William and Mary, Rutgers University, Nicholls State University, the University of Richmond, Carlton College, Michigan State University and the University of Texas, Austin.

“The future of the sciences depends on getting our students directly involved in research as often as possible, and the REU program has been a great way to accomplish that,” said Dr. Eric Powell of the University of Southern Mississippi. “Our REU students have contributed to some of the most important recent work done by the Center, and the Center has served as a great launching point for many scientific careers.”

Below, SCMFIS would like to highlight some of our recent REU students, and the work that they have done for the Center:



Garrett Bellin: Undergraduate Student at William & Mary, Williamsburg, Virginia

Garrett Bellin is a rising sophomore at William & Mary studying applied statistics and data science. He is a researcher for the William & Mary Center for Geospatial Analysis, performing GIS analyses for various clients. Currently, he is working with Dr. Roger Mann using GIS mapping to find cod spawning locations and determine how they are affected by ocean warming trends. Using the DOPPIO and GLORYS ocean temperature datasets, ideal temperatures for cod spawning will be ascertained and overlaid with substrate and cod location data. Garrett

hopes to be able to create GIS models that can predict future cod spawning grounds as ocean temperatures continue to rise. Policy changes could ultimately be affected which address the location and boundary of the Great South Channel Habitat Management Area near Nantucket.



Olivia Cohn: Undergraduate Student at William & Mary, Williamsburg, Virginia

Olivia (Livvie) Cohn is an undergraduate student veteran studying biology and marine science at William & Mary and is working with Dr. Roger Mann and Alex Marquardt as a Laboratory Technician in the VIMS Molluscan Ecology Lab. She has been assisting Alex in her PhD research by using image analysis to help track early growth and death rates of oyster spat. Livvie hopes to eventually take on individual research, gain more experience engaging with the local community, and fisheries management.



Caela Gilsinan: Undergraduate Student at William & Mary, Williamsburg, Virginia

Caela Gilsinan is an undergraduate at William & Mary and has been working on a wind energy/fisheries economy project with Dr. Andrew Scheld at the Virginia Institute of Marine Science. She has been able to meet with hatchery managers, researchers, and other experts in hatchery production, collecting information on production methods and costs, and developing a cost model to evaluate the economic viability of large-scale hatchery production for Atlantic surfclam. She developed skills in coding, simulation

modeling, and analyzing techno-economic cost models to evaluate fixed, variable, and average production costs and maximum production scales.



Emily Gaudet: Undergraduate student at Nicholls State University, Thibodaux, Louisiana

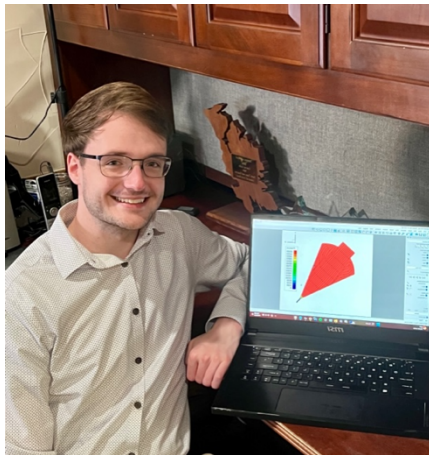
Emily Gaudet is a undergraduate student at Nicholls State University majoring in Biology Pre-med. She is currently working with Dr. Whitaker as an REU student on a coastal predatory diet study. Emily is focusing on Speckled Trout *Cynoscion nebulosus* collected from all five coastal study areas in Louisiana. She is using sequencing to identify prey that in conventional diet studies might be labeled as unidentified with the hope of providing a more complete picture of the Speckled Trout diet.



Becca Horwitz: BS Degree (June 2022), Carlton College, Northfield, Minnesota

Becca has been working with Dr. Daphne Munroe and Dr. Travis Miles at the Rutgers University Department of Marine and Coastal Science for over a year. She has been exploring the overlap between the Mid-Atlantic Bight Cold Pool (a seasonally stratified coastal ocean feature) and proposed offshore wind lease areas in the Mid-Atlantic Bight region using the ocean model DOPPIO. After graduating from Carleton College in June, she joined Dr. Munroe's lab to further explore the world of biological oceanography, as well as to continue her research. She is working on a paper that will hopefully be finished by spring 2023. Becca plans to apply

for her PhD in a year after finishing her time with Dr. Munroe to continue studying the potential effects of offshore wind on the coastal environment.



Nathan Kennedy: Undergraduate Student at the University of Texas at Austin, Austin, Texas

Nathan Kennedy is a senior civil engineering major at the University of Texas at Austin. He is working with the Ocean Engineering Group at UT as an undergraduate research assistant, using CFD software to model and analyze the performance of a clam dredge. His focus lies in optimizing the design of the manifold by minimizing the energy losses of fluid flow through it, which he achieves by using programs like Fluent and Tecplot 360 to model the velocity and pressure distributions of various manifold designs.



Thais Lobo-Emond: Undergraduate Student at the University of Texas at Austin, Austin, Texas

Thais Lobo-Emond is a senior civil engineering student at the University of Texas at Austin. She has been working with the Ocean Engineering Group on Computational Fluid Dynamic modeling, under the supervision of Dr. Spyros Kinnas. In her position as an Undergraduate Research Assistant, Thais has learned to work with software such as Ansys, SolidWorks, and Fluent to model flows and analyze velocity, pressure, force, movements, and other flow characteristics. This has been

using these software programs to improve the design of clam dredge jets for better overall performance.



Brett Renken: Undergraduate Student, University of West Florida, Pensacola, Florida

Brett Renken is from Oak Lawn, Illinois and is currently an undergraduate student at the University of West Florida, majoring in Marine Biology. He is working with Dr. Justine Whitaker as an REU student in the Coastal Genomics Lab at Nicholls State University. Brett's project is part of a larger diet study and he is focusing on Spanish Mackerel *Scomberomorus maculatus*. He is performing dissections to remove gut contents, extracting DNA from the contents, and then sequencing to identify the contents to the lowest taxonomic level. He has also assisted with field work for other graduate students at Nicholls State, ranging from terrapin surveys at

Grand Isle, Louisiana, collecting environmental DNA samples for mussel and fish species at sites in the Sabine and Calcasieu basins.



Ellen Rowe: Undergraduate Student at William & Mary, Williamsburg Virginia

Ellen Rowe is an undergraduate student studying biology and marine science at William & Mary. She is also involved with William & Mary's Center for Geospatial Analysis. She has created communication materials for conservation work and scientific research experience using her knowledge of Geographic Information System (GIS). She is currently working with Dr. Roger Mann as an REU student at the

Virginia Institute for Marine Science (VIMS). She will be looking at oyster survey data, finding ways to present and share this research effectively. She is excited to combine her interests in marine science, GIS, and science communication during her REU project.



Brody Phillips: Undergraduate Student at William & Mary, Williamsburg, Virginia

Brody is a first-generation undergraduate student at William & Mary majoring in biology and minoring in psychology. He is currently working with Dr. Roger Mann as a REU (Research Experiences for Undergraduates) student in the Virginia Institute of Marine Science (VIMS) Molluscan Ecology Lab to investigate the potential electromagnetic field (EMF) impacts of inter array cables from offshore wind farms on invertebrate species. This project consists of literature review of offshore wind farms, power cable modeling, and previously studied EMF relationships within the marine environment. While previous research in this area is minimal, predominant focus has been on more charismatic (vertebrate) species such as sharks, dolphins, and turtles. Almost no research related to underwater transmission cables and EMF alteration impacts at the neurological level has been done on invertebrate species. Along with literature review, he will be meeting with energy transmission engineers, neurophysiology researchers, and other professionals to determine the significance of these impacts and how they affect neuron communication and function in invertebrates.



Austin Sanchez: Undergraduate Student at the University of Texas at Austin, TX

Austin Sanchez is a second year Environmental Engineering student at the University of Texas, Austin. He has been working with the Ocean Engineering Group's research team since his first year. My role is on the experimental side. He has been working on a project to optimize clam dredge jet speeds. As part of the project, he has helped design the clam dredge manifold and jets using 3D software, and has manufactured them on campus using 3D printers.



Rebecca Walsh: Undergraduate Student at the University of Richmond, Richmond, VA

Becca is an undergraduate at the University of Richmond studying biology, environmental studies, and geography. She spent the summer working with Dr. Robert Leaf at the University of Southern Mississippi Gulf Coast research lab, researching the caloric content of forage fish in the Gulf of Mexico. Through direct sampling, spatial, temporal, and age based trends of caloric content were investigated.

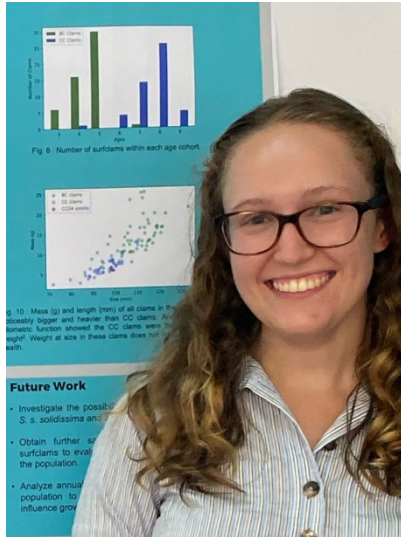
Throughout the summer, she developed skills in sampling, new lab techniques, and coding. During the summer, she was also able to participate in NOAA SEAMAP ground fish survey. Becca is currently working on a paper remotely with

Dr. Leaf and as part of her honors thesis that will be finished in spring 2023 when she graduates from Richmond.



Jasmine Whelan: BS Graduate, William & Mary, Williamsburg, Virginia

Jasmine received a B.S. in biology with a marine science minor from the College of William & Mary. Previously she worked in an avian lab where she studied the effect of mercury pollution and stress on a songbird's ability to promote quality feather growth. As an REU recipient at VIMS, Jasmine worked in the Molluscan Ecology Lab assisting PhD student Alex Marquardt in her research on Virginia oyster life history.



Brynne Wisner: Undergraduate, Michigan State University, East Lansing, Michigan

Brynne Wisner is a senior at Michigan State University and has been working with Dr. Daphne Munroe at the Rutgers Haskin Shellfish Research Lab. She has been researching the age demographics of an Atlantic surfclam population with previously low abundance on the southern end of the Atlantic surfclam range. The results from this study will help determine current population stability and inform future fishing efforts. Brynne will be graduating this semester and hopes to continue to participate in fisheries research after graduation.

About SCEMFIS

SCEMFIS utilizes academic and fisheries resources to address urgent scientific problems limiting sustainable fisheries. SCEMFIS develops methods, analytical and survey tools, datasets, and analytical approaches to improve sustainability of fisheries and reduce uncertainty in biomass estimates. SCEMFIS university partners, University of Southern Mississippi (lead institution), and Virginia Institute of Marine Science, College of William and Mary, are the academic sites. Collaborating scientists who provide specific expertise in finfish, shellfish, and marine mammal research, come from a wide range of academic institutions including Old Dominion University, Rutgers University, University of Massachusetts-Dartmouth, University of Maryland, and University of Rhode Island.

The need for the diverse services that SCEMFIS can provide to industry continues to grow, which has prompted a steady increase in the number of fishing industry partners. These services include immediate access to science expertise for stock assessment issues, rapid response to research priorities, and representation on stock assessment working groups. Targeted research leads to improvements in data collection, survey design, analytical tools, assessment models, and other needs to reduce uncertainty in stock status and improve reference point goals.