



THE UNIVERSITY OF
SOUTHERN
MISSISSIPPI®

COASTAL USM

ANNUAL REPORT
2023

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Photo by L. Hamdan

This publication reflects on the amazing accomplishments over the year in ensuring The University of Southern Mississippi's coastal footprint fulfills its vision of being a national leader in addressing issues relevant to people living in coastal and maritime settings. The report provides stories of our commitment to investing in education, advancing research and development, and driving innovation across the Gulf Coast.

Investing in Education on the Gulf Coast

The Gulf Park campus in Long Beach is Mississippi's only university beachfront campus situated along the Gulf of Mexico. It serves as the hub for students enrolled in academic programs for careers in coastal and maritime settings. While this includes technical programs like ocean engineering and hydrographic science, it also includes other high-demand programs like social work and education. In 2023, a new accelerated nursing pathway launched, and the ocean engineering program was fully accredited.

Advancing Research and Development

A day in the life of researchers and scientists includes fascinating projects like shark tagging, studying long-term effects of natural and man-made incidents, and balancing society's ability to live, work, and play along the coast. The contributions of researchers help inform decisions about keeping the Gulf of Mexico vibrant for generations to come. USM has made strategic investments in infrastructure to elevate our capabilities.

Driving Innovation Across the Gulf Coast

The University and its network of partners serve an important role in developing new technologies useful in coastal and marine settings. In 2021, the Gulf Blue initiative was launched to represent the Gulf Coast's innovation-focused economy. With a void of technology-focused new company startups along the Gulf of Mexico specializing in coastal and ocean technologies, the Gulf Blue Navigator program was established by the USM Research Foundation to attract startups to the region. In 2023, the program's first cohort of companies completed the inaugural program, and a new cohort will begin in early 2024. Collectively, these efforts are attracting new companies and good jobs to the region.

HANCOCK COUNTY

HARRISON COUNTY

JACKSON COUNTY

John C. Stennis
Space Center

USM Gulf Park
Campus

Point Cadet

USM Gulf Coast
Research Laboratory

GULF OF MEXICO



COASTAL USM

Signature Moments



In 1947, the first official GCRL Summer Field Program was held at Magnolia State Park, now called Gulf Island National Seashore. This botany class was taught by Dr. Richard Caylor, the first director of GCRL.

USM's Gulf Coast Research Laboratory Celebrated 75 Years of Rich History



Southern Miss' Gulf Coast Research Laboratory (GCRL) was founded Aug. 29, 1947, and later, the Mississippi Legislature approved the bill in 1948 making it official, with GCRL designated as Mississippi's marine laboratory. GCRL's first summer session was held at Magnolia State Park, now the Gulf Islands National Seashore. The idea for the lab was to establish a teaching and research laboratory focused on coastal Mississippi and surrounding ecosystems.

Today, GCRL upholds the values needed to continue the same vision and strengthen the blue economy with more than 200 students, faculty, and staff.

Vision for GCRL dates to early 20th century

Archives indicate that as early as the 1920s efforts were made to establish a research lab along the Mississippi coast by bringing students to the area during spring break. In 1946, Dr. Richard Caylor, GCRL's founder and first director, and a group of 20 students, visited the coast as the first GCRL Summer Field Program course.

GCRL officially became part of USM in 1988 and has two sites, Halstead and Cedar Point. Acquired in 1949, the 40-acre Halstead site is surrounded by beaches, marshes, and barrier islands; the 224-acre Cedar Point site was secured in 1995.

Persistence

In August 2005, Category 3 Hurricane Katrina made landfall with a 24-foot surge, and 3-4 feet of water in buildings bringing damaging floods and destruction to many buildings on the Halstead campus.

Persistence was the word repeated when describing the lab during these trying



times. Until buildings were rebuilt, research continued in a tent outside. But the GCRL community persisted.

GCRL had tremendous growth. It was one of the few marine labs along the Gulf of Mexico. We have a beautiful place here. It is a world-class marine science institution!

— JIM FRANKS
Senior Scientist, CFRD



Jim Franks—1967

Jim Franks began his time at GCRL in the summer of 1963 as an undergraduate student from the University of Tennessee in the summer program courses.

Franks is the longest-serving employee at the lab and works in fisheries biology in the Center for Fisheries Research and Development (CFRD) on research projects.

GCRL Celebrates Throughout the Year



People of all ages visited us on Community Day for hands-on activities and demonstrations to learn about our oceans and why they are important, and what the 200 faculty, staff, and students at GCRL are doing to understand and protect them.

— DR. KELLY DARNELL
Director, GCRL

Community Day

Families experienced a fun-filled Community Day open house at GCRL that featured various exhibits showcasing current research conducted at the lab and fun kids' activities, including fish prints, a passport stamp activity, and face painting.



Attendees were able to dive deeper into the wonderful research opportunities at GCRL, many focusing on the blue economy.

Celebratory Reception

GCRL hosted a reception at the Marine Education Center with community leaders, former GCRL directors, partners, and friends of the lab. The Thad Cochran Marine Aquaculture Center provided oysters that were raised at the GCRL Cedar Point site.



Getting the Word Out

Dr. Kelly Darnell, GCRL director, presented on the history of GCRL to several organizations and groups across the coast, as well as several news features in local and regional outlets.

A Vision of the Future

GCRL continues its focus on higher education, working with local, state, and federal organizations to promote jobs and research in the blue economy.

GCRL is poised to continue its future as Mississippi's designated marine laboratory, with innovative research and education for students of all ages. A new oyster hatchery is breaking ground, and valuable opportunities for leaders to become involved along the Gulf Coast abound.





USM, Port of Gulfport Celebrate Roger F. Wicker Center for Ocean Enterprise with Ribbon-Cutting Ceremony

Federal, state and local officials stood at the water's edge Friday, October 13 and celebrated the completion of USM's Roger F. Wicker Center for Ocean Enterprise at the Mississippi State Port Authority (MSPA) at Gulfport.

The facility will serve as the centerpiece of research and development in the Gulf, creating a unique maritime technology environment on the Mississippi Coast.

"It has been an honor to work alongside so many Mississippians to bring resources to the impressive work our business, technology and educational

leaders are conducting," Senator Roger Wicker said.

Lead by USM Coastal Operations, the Center for Ocean Enterprise connects the state's major research universities, federal partners and private companies to expand the Blue Economy.

"The Roger F. Wicker Center for Ocean Enterprise is appropriately named and ideally located," Gov. Tate Reeves said. "This facility will strengthen Mississippi's growing Blue Economy by charting new pathways for technological innovation from right here in

USM's Fabrication Shop Supports Rapid Prototype, Marine Research Center (MRC) Mission

The University's Prototype Fabrication Shop, at the MRC in Gulfport, shows great promise in its mission to provide state-of-the-art fabrication in support of blue technology innovation in the Gulf of Mexico.

The Prototype Fabrication Shop, which opened in early 2023, features \$1.8 million in RESTORE (Resources and Ecosystems Sustainability, Tourist Op-

portunities, and Revived Economies of the Gulf Coast States) Act-funded equipment, including a CNC 5-axis mill, a plasma table, hybrid laser/router table, and 3D printers, among others.

USM's new fabrication shop has been commended for being a "world-class shop" for its capabilities in machining, welding, bending, and other types of fabrication.



This Center will support the innovative work that has put Mississippi's Blue Economy on the cutting edge of ocean technology. I am eager to see all of the great partnerships and developments that USM will launch from this site.

— SENATOR ROGER WICKER

Mississippi. Congratulations to USM on this amazing accomplishment, and I can't wait to see all the good things that come out of the Center."

The facility's 62,000-square-foot location at the Port allows maritime operations to have custom and secure access to the Gulf of Mexico for ocean exploration, forecasting and data collection. It also promotes investment in high-end engineering and development of advanced technology.

Great Minds Come Together at the Largest Gathering of Geospatial Professionals in Mississippi

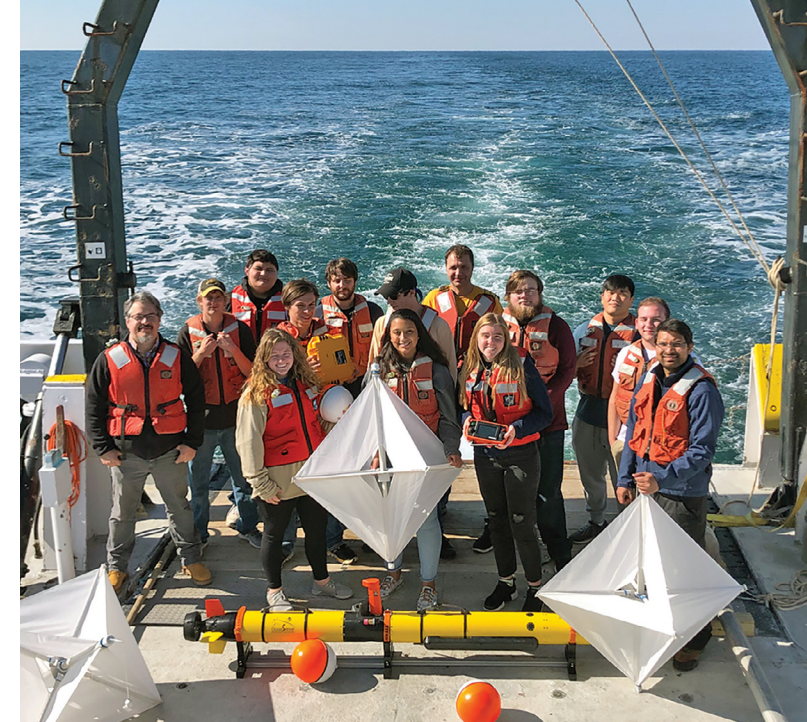
Southern Miss hosted the Mississippi Geospatial Conference (MS GEO CON), now in its 11th year, at the Gulf Park Campus Fleming Education Center on Oct. 12 and 13. MS GEO CON is the largest gathering of geospatial professionals, which includes over 140 professionals and 17 sponsoring organizations that range from software developers to uncrewed autonomous vehicle operators.

Dr. David Holt, associate professor of geology in the School of Coastal Resilience, was seen smiling and excited to talk about his successful work in integrated Ground Penetrating Radar (GPR) and Global Position Systems (GPS) in Subterranean Mapping of gravesites across the Gulf Coast region.

His work has sparked much interest from his students and local gravesites to find areas where cemeteries or burial plots were once occupied. Holt described the advancement of geo-technology in finding these sites for families of loved ones who are looking to find relatives in unmarked graves.

Holt has taken many of his students to these burial sites to provide them with a hands-on experience with GPR. Many of his courses at USM involve field work and skills that his class can take with them beyond graduation.

Many of those investments include the offering of two new programs within the last year in the School of Coastal Resilience that focus on Sustainability Studies and Sustainability Sciences (Coastal System Dynamics). Both programs are offered as undergraduate degrees.



USM's Ocean Engineering Program Receives Accreditation Through ABET

The School of Ocean Science and Engineering's bachelor's degree program in ocean engineering has been accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), the global accreditor of college and university programs in applied and natural science, computing, engineering, and engineering technology.

Through an ABET accreditation, students can be confident that they are acquiring a top-notch education that can enhance future employment and career opportunities. The value of the accreditation is significant and can help acquire eligibility to various grants and scholarships. The accreditation is recognized globally with many jobs now requiring graduation from an ABET-accredited program. Sought worldwide, ABET's voluntary peer-review process is highly respected because it adds critical value to academic programs in the technical disciplines, where quality, precision and safety are of the utmost importance.

The accreditation was a tedious but rewarding journey, starting in 2017 when the ocean engineering program began. This success is due to the dedicated faculty who shepherded the process to success, and the early graduates of the program. Once programs have graduated their first student, they are eligible for accreditation. Those on the team were responsible for completing a readiness review, evaluation requests, and a self-study report resulting in an on-site visit by the ABET commission. Due to the dedicated work of the entire OE team, the program gained accreditation in the shortest possible time since its inception.



KNAUSS FELLOWSHIP

USM Graduate Students Earn Prestigious Knauss Fellowship



ABIOLA OBAFEMI

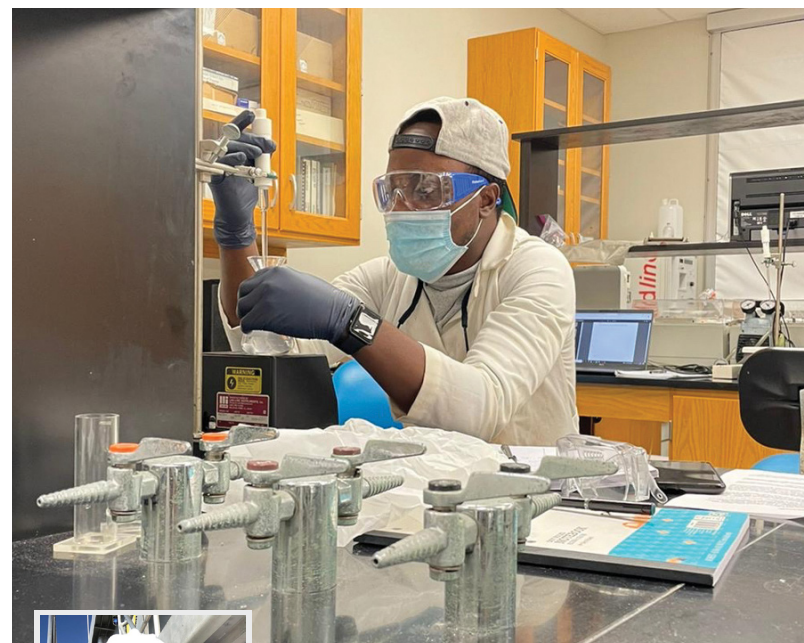
Abiola Obafemi, a Southern Miss graduate student in the School of Ocean Science and Engineering program, has been selected for the 2024 class of the John A. Knauss Marine Policy Fellowship for the

Executive Branch of government by the National Oceanic and Atmospheric Administration (NOAA).

Obafemi is in his second year enrolled in the master's program for coastal sciences. A native of Nigeria and an international student, he started the program in 2022 and has excelled.

The Knauss Fellowship is awarded for a span of one year to graduate students across the United States. The grant allows recipients to apply their knowledge of the sciences and obtain experiences in legislative and public policy. Students apply through their local sea grant, get selected and become part of a national competition.

A total of 85 winners have received this fellowship from 66 different universities across the country. Each from diverse backgrounds, the recipients will be a part of science and policy legislation.



HAMEED AJIBADE

Hameed Ajibade, a graduate student at USM's School of Ocean Science and Engineering (SOSE), has been selected for the 2024 class of the John A. Knauss

Marine Policy Fellowship for the executive branch of the U.S. government by the National Oceanic and Atmospheric Administration (NOAA).

"I was really excited when I got the news of the award," Ajibade said. "This has been so amazing, and I thank Dr. Jerry Wiggert, USM professor of marine science, for recommending me. This opportunity is a stepping stone to a greater future. I'm working with a lot of people, and this will give me great experiences. I look forward to getting more insights."

The Knauss Fellowship enables recipients to apply their knowledge of the sciences and obtain experiences in legislative and public policy. Students apply through their local sea grant, get selected, and become part of a national competition. The fellowship was awarded to 85 recipients from 66 different universities across the country.

A native of Nigeria, Ajibade enrolled at USM as an international student in the fall of 2021. Dr. Wiggert is proud of what Ajibade has accomplished, especially with his enrollment in the middle of the COVID-19 pandemic.

Ajibade focuses his research on circulation modeling, studying the influence of estuarine-shelf exchange on biogeochemical processes in the Mississippi Bight.



NOAA Assistant Administrator Visits Southern Miss on the Coast

USM hosted leadership from NOAA on Wednesday, March 15, as they toured Coastal USM.

In connection with her appearance at the U.S. Hydrography Conference, 2023, Nicole LeBoeuf, assistant administrator of NOAA, visited USM sites along the Gulf Coast. In keeping with existing long-term agreements with USM, NOAA seeks to enrich its work along the Gulf Coast region utilizing Coastal USM's vast resources to support strategic objectives.



The opportunities along the Mississippi Gulf Coast with Coastal USM are limitless with access to top-rated research facilities and partnerships with academia to fuel workforce development, economic development, ocean research, and innovation.

— NICOLE LEBOEUF, Assistant Administrator, NOAA

MGCCC and USM Presidents Sign Memorandum of Agreement

The presidents of Mississippi Gulf Coast Community College (MGCCC) and USM signed a Memorandum of Agreement (MOA) on June 26. The MOA allows MGCCC to offer freshman and sophomore classes at the Gulf Park Campus and provides students on any MGCCC campus who complete an Associate of Arts or Associate of Science degree a seamless pathway to admission to USM. If a former MGCCC student is already a USM student, they will be able to transfer hours back to MGCCC to complete an associate degree.

"We are excited about this unique partnership with Mississippi Gulf Coast Community College," said Southern Miss President Joseph S. Paul. "This new pathway will help MGCCC students move seamlessly from their associate degree to a Southern Miss bachelor's degree, will provide classroom space on our beautiful Gulf Park campus for MGCCC to deliver select courses to their current students, and will allow MGCCC students to have a first-hand view of all Southern Miss has to offer them on the Coast as the next step in their education."

Benefits to students include eligibility for stackable scholarships at USM and ease of transition and admission to USM upon completion of their degree at MGCCC.





The book will help you learn to imagine your best possible self and experience what it feels like to live your full potential so you can flourish and live out your destiny.

— DR. WENDI LORD

Southern Miss Human Capital Development Ph.D. Alumna Publishes First Book

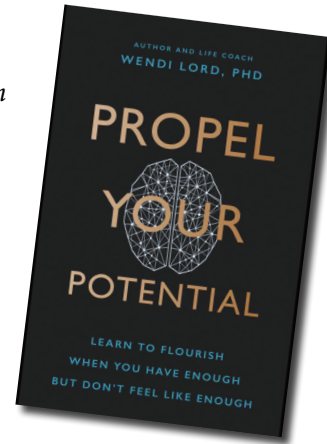


The School of Leadership at The University of Southern Mississippi is proud to salute Human Capital Development Ph.D. (ITD) alumna, Wendi Lord, Ph.D., who has just published her first book.

Titled *Propel Your Potential: Learn to Flourish When You Have Enough but Don't Feel Like Enough*, the book is a collection of eye-opening

but gentle exercises that helps the reader adjust their thinking and get clear about self-image and life goals.

The author, who works as a life coach, says the book is backed by academic research used in her doctoral dissertation.



Dr. Kelly Darnell Named Director of USM's Gulf Coast Research Laboratory



DR. KELLY DARNELL
GCRL Director

The University of Southern Mississippi is excited to announce the appointment of Dr. Kelly Darnell as director of the University's Gulf Coast Research Laboratory (GCRL)

Dr. Darnell currently serves as an associate research professor in the School of Ocean Science and Engineering as well as the director of the Mississippi-Based RESTORE Act Center of Excellence. In May of 2022, Darnell was appointed interim director of GCRL.

"I'm honored to serve in this role. GCRL is a leader in research and education. When you step onto campus, you realize it is a special place. I look forward to the opportunity to support GCRL's faculty, staff, and students," said Darnell.

A native of Buffalo, NY, Darnell earned her Ph.D. at the University of Texas at Austin, her M.S. at the University of South Alabama and her B.A. at Wittenberg University.

Gulf Park Campus Expands Academic Faculty to Educate Students on Coastal Resilience



DR. ERICA MORGAN



DR. DESLIE BONANO-BROUSSARD

Southern is proud to announce the expansion of its academic faculty for the School of Social Work at the USM Gulf Park campus, with a focus on educating students about the challenges and resilience of coastal communities. This initiative aims to prepare students for the unique situations they may encounter within a coastal community, including the aftermath of natural disasters.

Dr. Erica Morgan and Dr. Deslie Bonano-Broussard, each with more than 22 years of experience in a coastal community environment, will be joining the academic faculty at the Gulf Park campus. They have worked closely with patients during challenging times, including the aftermath of Hurricane Katrina and the ongoing COVID-19 pandemic.



First-hand experience and expertise will provide students with invaluable insights into the unique situations they may encounter when working with clients in coastal communities.

— DR. JACOB BRELAND
Associate Vice President for Academic Affairs

USM's New Sustainability Sciences and Studies Programs End First Semester

USM's School of Coastal Resilience at its Gulf Park Campus concluded its first year since the addition of two new majors, Sustainability Sciences (Coastal System Dynamics) and Sustainability Studies.

The first semester started in Spring 2023 with hands-on classrooms that introduced students to sustainability efforts along the coast, as well as ecosystems of fresh and saltwater environments.

Dr. Christopher Foley, undergraduate coordinator for Sustainability Studies and a founding member of the School of Coastal Resilience, said the Bachelor of Arts degree program in Sustainability Studies is grounded in humanistic and communication-orientated approaches to sustainability.

Dr. David Holt, undergraduate coordinator for Sustainability Sciences (Coastal System Dynamics) was thrilled about the first set of students to pursue this major, particularly using the Gulf of Mexico as a classroom. Sustainability Sciences (Coastal System Dynamics) is an undergraduate program bringing together ecology, geography, math, and statistics foundation along with an applied field approach. The program focuses on resilience and sustainability of coastal areas.



NOAA Provides \$2.5M Grant to Help USM Develop Data Assembly Hub

USM's renowned expertise in ocean science research and technology provided the impetus for a \$2.5 million grant awarded recently to the University by NOAA.

The award will be used to support the development of a Data Assembly Hub for Uncrewed Systems (UxS), which are autonomous or remotely operated vehicles that collect environmental data. NOAA currently uses UxS for seafloor and habitat mapping, ocean exploration, marine mammal and fishery stock assessments, emergency response, and at-sea

observations that improve forecasting of extreme events, such as harmful algal blooms and hypoxia.

The Mississippi coast has become a national hotbed for testing and use of UxS to collect important data characterizing the seafloor and ocean habitats, measuring atmospheric conditions, and coastal monitoring such as erosion or damage assessments. Data collected from commercial and NOAA uncrewed systems will further the growth of the New Blue Economy around the nation.





USM Salutes 2023 Graduates of Hydrographic Science Program

USM's esteemed Hydrographic Science program has produced another diverse and talented group of graduates who were honored during a Class of 2023 recognition ceremony held August 1 on the University's Gulf Park campus in Long Beach.

USM is one of only three universities in North America providing a pathway to a certificate of completion of competence of a Category-A program recognized by the International Board on Standards for Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC). The B.S. in Marine Science, with emphasis in Hydrographic Science, is the only program in North America leading to a certificate of completion of competence of a Category-B program recognized by IBSC.

This year, 15 students graduated from the M.S. in Hydrographic Science, the Joint International Hydrographic Applied Science Program – a cooperation between the U.S. Navy, Naval Meteorology and Oceanography Command, and USM. Three others graduated from the University's B.S. program in marine science, with an emphasis in hydrographic Science.

USM School of Social Work Receives Accreditation Reaffirmation

Following a thorough review by the Commission on Accreditation (COA) for the Council on Social Work Education, the Master of Social Work (MSW) and Bachelor of Social Work (BSW) programs in USM's School of Social Work received accreditation reaffirmation through June 2030.

Founded in 1952, the Council on Social Work Education (CSWE) is the national association representing social work education in the United States. Its members include over 750 accredited baccalaureate and master's degree social work programs, as well as individual social work educators, practitioners and agencies dedicated to advancing quality

social work education. Through its many initiatives, activities, and centers, CSWE supports quality social work education so that social workers play a central role in achieving the profession's goals of social and economic justice.

The MSW program started at Southern Miss in 1974 and has been continuously accredited since 1976. The BSW program began at USM's Gulf Park campus in 1996 and achieved initial accreditation the same year. Accreditation of the undergraduate program has continuously been maintained since that time, including the on-site program at Gulf Park since fall 2005.



DR. LEILA HAMDAN
Associate Vice President for Research, Coastal Operations
Professor, School of Ocean Science and Engineering

Hamdan Selected for National Academies Panel to Guide Ocean Science Into the Next Decade

Dr. Leila Hamdan, associate vice president of research, Coastal Operations, and professor in the School of Ocean Science and Engineering at Southern Miss, has been selected to contribute her expertise to the National Academies' 2025-2035 Decadal Survey of Ocean Sciences.

This survey will advise the National Science Foundation's Division of Ocean Sciences' strategy towards investments in research, oceanographic infrastructure and development of the future ocean science workforce.

The 23-member expert committee includes ocean scientists from across the nation working in disciplines spanning biological, chemical, physical and geological oceanography, policy, social science and engineering.

The committee's work will span approximately 18 months, and through a careful framework, will develop a list of questions that have potential to transform what we know about the ocean, and the critical role the ocean plays for all life on earth.

USM Hosts MGCCC and PRCC Students for STEM in the Sound Day

USM's Coastal Operations granted special access to Mississippi Gulf Coast Community College & Pearl River Community College students for STEM in the Sound day to engage with faculty, scientists, and engineers aboard the research vessel *Jim Franks*.

These students received one-on-one time with educators, scientists, and engineers experienced in the natural sciences

and technical programs focused on the blue economy.

Students boarded the research vessel *Jim Franks* and cruised into the Mississippi Sound, working alongside faculty researchers and engineers experienced in the natural sciences and technical programs focused on the blue economy. The expedition focused on raising awareness of important topics like resilient ocean and coastal environments. These events were coordinated by the team at USM's Marine Education Center.





Acclaimed Author Lecture at USM Gulf Park for Black History 365 Programming



USM’s Gulf Park Campus sponsored a signature Black History Month event as award-winning author and Mississippian Jesmyn Ward delivered a special presentation on Feb. 28.

Ward presented a lecture titled, “Black Excellence Celebration: A Journey to Prosperity.” Her visit included a Question & Answer session facilitated by Dr. Whitney Martin, assistant teaching professor of English, as well as a book signing.

Jessica Langston, director of Student Engagement and Strategic Initiatives at USM Gulf Park, explained that Ward’s visit was the culmination of a student-led initiative spearheaded by Queliah Conway, a student employee in the Office of Student Affairs who serves as vice president of Programming for the Gulf Park Student Government Association.

In 2022, the U.S. Library of Congress selected Ward as the winner of the Library’s Prize for American Fiction. At age 45, Ward is the youngest person to receive the Library’s fiction award for her lifetime of work.

USM Welcomes Excited, Engaged Cohort to New Accelerated BSN Pathway

When Robin Holman made the decision to switch from a teaching career to one in nursing, she knew a fast-track degree option would be her best bet. She found that golden ticket with USM’s new, accelerated BSN pathway.

Holman is part of the initial ABSN cohort that began classes earlier this month at USM’s Gulf Park campus in Long Beach. Nine students are currently enrolled in the accelerated degree plan.

The unconventional pathway helps eligible students earn a BSN degree in a shorter time and decreases barriers to admission, while providing benefits to those who have already earned a higher education degree. Plans call for two admission cycles per year.

Students enrolled in this degree option will be eligible to bypass some typical BSN requirements because they have already earned a degree.

USM also offers a BSN program for those who do not already have a bachelor’s degree on the Hattiesburg campus, as well as a fully online RN-BSN program.



SIGNIFICANT COMPONENTS OF THE ACCELERATED PLAN

- Can be finished in 12 months
- CCNE accredited
- Same degree as traditional BSN – has same clinical experiences
- Scholarships available
- Able to bypass some typical requirements, having already earned a degree

USM’s Roger F. Wicker Center Offers Maritime Uncrewed Systems Workforce Training

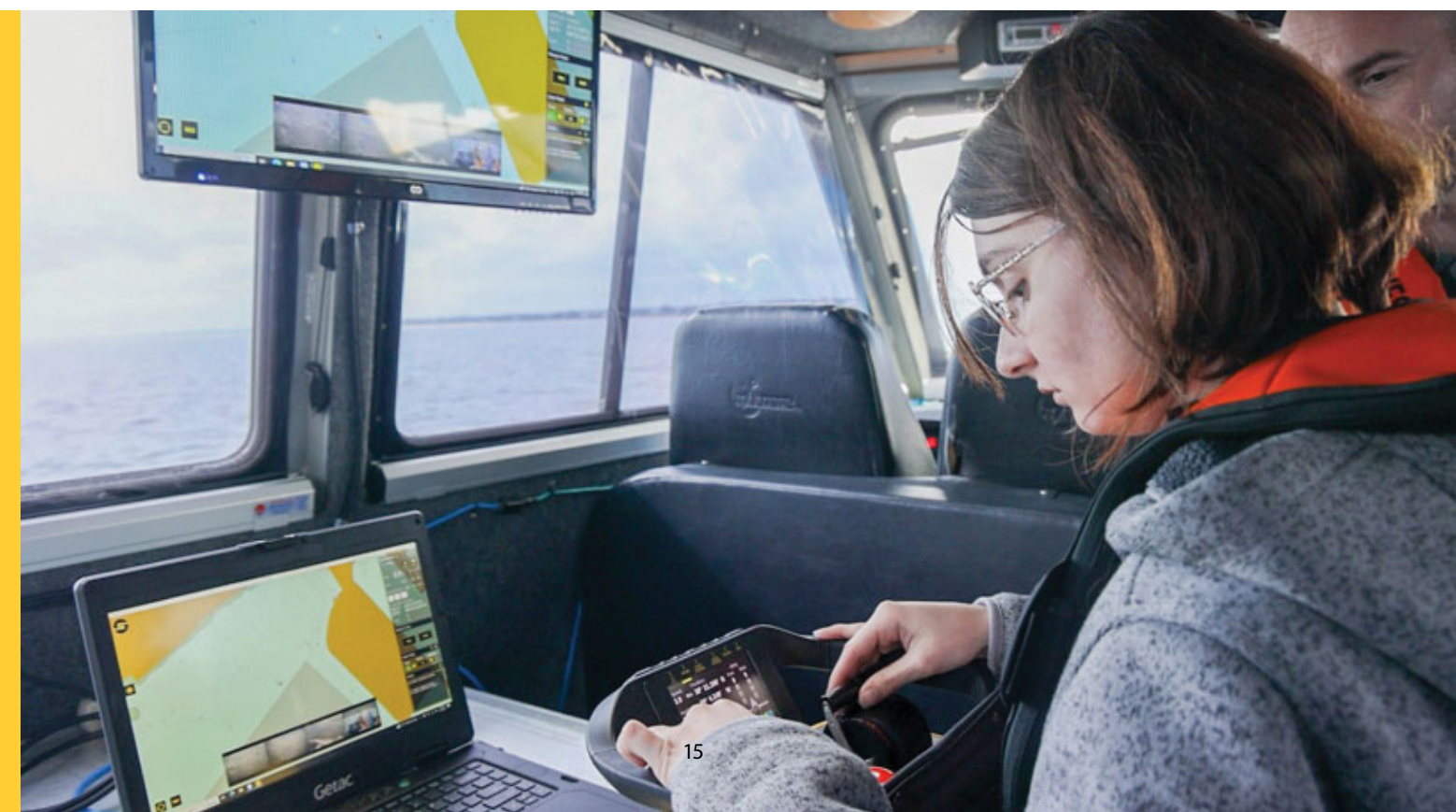
USM’s Roger F. Wicker Center for Ocean Enterprise began offering four workforce training workshops made available through a \$980,398 grant from AccelerateMS. This grant enabled qualified individuals to participate at no cost through this workforce development initiative.

The workforce training allows active-duty, guard, reserve and transitioning military members of the traditional blue economy workforce, and community college and under-served students opportunities for cross-training and re-training to help advance their careers in the blue technology economy and provide critical training disrupted by COVID-19.

Four bi-monthly training programs were planned at the Marine Research Center located in Gulfport. Training began on Feb. 27 and included:

- MARITIME AUTONOMY
- MARITIME DATA ANALYTICS
- MARITIME UNCREWED SYSTEMS
- MARITIME CYBER

These four workshop training programs build on the tradition of success for Ocean Enterprise’s five Federal Operational Seminars offered through The Center for Higher Learning at Stennis Space Center.





DR. SHANNON CAMPBELL, Senior Associate Vice President of USM's Coastal Operations, announced her retirement after 28 years of public service leveraging her professional experience and expertise of which the last three have been focused on the school's Gulf Coast presence.

Dr. Shannon Campbell Retires

Dr. Campbell's career at USM began in 2010 as an adjunct professor, teaching courses in human capital development and workforce models. In 2013, she was named director of USM's Trent Lott National Center for Economic Development and Entrepreneurship, where she helped launch economic development outreach services of the university. During this time, she served as a key leader in establishing the Mississippi Defense Initiative focused on protecting, growing, and diversifying defense and national security assets as an economic driver for the state.

In 2021, she became the senior associate vice president of Coastal Operations, serving as the lead administrative officer for the coast.

Dr. Campbell is proud of the positive steps made in bringing cohesiveness to USM coastal campuses, including the establishment of *Gulf Blue*. USM has celebrated significant milestone moments in the last two years with the 100th anniversary of Gulf Park campus and the 75th anniversary of Gulf Coast Research Laboratory. Now with the opening of

the Roger F. Wicker Center for Ocean Enterprise, she is proud of how Coastal USM is continuing to make strides in innovative learning and research.

Over the course of her career, Campbell's grant administration experience has accumulated 22 federal and state grants totaling more than \$48 million. Two of the recently awarded grants included \$7.9 million federal grant for the construction of a Language Speech Disorder Therapy building and \$2.5 million state grant for establishing a Digital and Multimedia Center of Excellence.

At Gulf Park, she noted the interior and exterior renovations and improvements to campus facilities, along with paving the way for new programs in 2024 like the Executive Education Services, to be housed in Hardy Hall.

Dr. Campbell and her husband, Neal, are excited to enter a new chapter of life full of travels and quality time with their family. Her mark has been made as a trailblazer for Coastal USM growth and development.

Lucas Named USM Vice President for Research



The University of Southern Mississippi has named Dr. Kelly Lucas vice president for research.

Lucas has served in the position on an interim basis since July 1, 2022. Over the past year, she has helped secure significant federal, state and private funding in support of

faculty research projects, economic development, and undergraduate and graduate student research, as well as completing an in-depth analysis highlighting the critical role of non-STEM programs in maintaining the University's Carnegie R1 designation.

The current portfolio for the vice president for research includes oversight for all research-related initiatives across all USM locations, including externally funded projects, congressional requests, intellectual property, technology transfer and commercialization, economic development, innovation management, creative scholarship and corporate recruitment. The position reports directly to the University president and also serves as executive director of the University's Research Foundation. Following Dr. Lucas's appointment, Dr. Leila J. Hamdan was appointed associate vice president for research for Coastal Operations, filling the role that Lucas previously held.



Ms. Osho-Abdulgafar's efforts to support women in pursuing careers in Marine Science will surely be invaluable in this respect.

— DR. ROBERT LEAF, Associate Professor and Interim Director, School of Ocean Science and Engineering and Department Chair, Division of Coastal Sciences



USM Graduate Student Selected as Women in Ocean Science Ambassador

Nimah Osho-Abdulgafar, a doctoral student in Coastal Sciences at USM has been selected as a Women in Ocean Science University Ambassador for 2023.

Women in Ocean Science C.I.C. is a non-profit female empowerment organization that aims to break down gender barriers and elevate female voices within the marine science and conservation space. Since 2018, WOS has worked to close the gender gap through education, celebration and empowerment, highlighting the intrinsic link between the need to protect the ocean and the need for a diverse, inclusive workforce of those working to protect it.

Dr. Robert Leaf, associate professor and interim associate director of the School of Ocean Science and Engineering, also serves as associate director over the Division of Coastal Sciences. As Osho-Abdulgafar's faculty adviser, he emphasizes the significance of her WOS honor. "The faculty and administration of the Division of Coastal Sciences is committed to providing world-class research and educational opportunities to students without regard to their identity, for the benefit of the citizens of our state."

Nail Named USM Provost and Senior Vice President for Academic Affairs

Dr. Lance Nail, a veteran university faculty member and administrator, has been named The University of Southern Mississippi's provost and senior vice president for Academic Affairs.

As provost and senior vice president for Academic Affairs, Nail is expected to provide leadership to the University's academic programs to foster excellence in teaching, research, and service. The provost is responsible for all aspects of the University's academic mission and leads its efforts in the pursuit of academic excellence at all campuses and teaching sites.



Motter Named USM Vice President for Student Affairs and Enrollment Management

Dr. Kristi Motter, a Southern Miss alumna with significant experience in student affairs, student recruitment and financial aid, has been named The University of Southern Mississippi's vice president for student affairs and enrollment management.

"Among our highest priorities are creating an unrivaled student experience and growing enrollment," said Dr. Joseph S. Paul, university president. "Dr. Motter has a proven track record of success in these two vital areas. She will lead with student-centered energy, enthusiasm, and a sense of urgency."





Academic Affairs at Gulf Park



The USM Gulf Park campus, located in Long Beach, is distinguished for its academic programs that integrate experiential learning throughout the curriculum. Academic Affairs at Gulf Park assumes a pivotal role in sculpting and delivering high-quality educational experiences to a diverse student body. With an extensive portfolio of nearly 50 academic programs and a steadfast commitment to community engagement, Academic Affairs at USM Gulf Park has been a driving force in supporting excellent instruction, cultivating relationships, advancing impactful research, and enriching the regional educational landscape.

JACOB BRELAND, Associate Vice President for Academic Affairs | Coastal Operations

Mission and Community Engagement

In 2023, Academic Affairs was steadfast in its mission to cultivate relationships and enhance awareness of USM’s substantial contributions to the Mississippi Gulf Coast community. The unit actively participated in a myriad of forums, including Chamber of Commerce events, Mississippi Society for Human Resource Management (SHRM) meetings, and local community gatherings such as *Jeepin’ the Coast* and Gulf Park campus events like Discover Gulf Park and Career Counselors outreach.

Research and Impact

A noteworthy event in 2023 was the Mississippi SHRM conference held at the IP Casino Resort Spa in September. At this conference, the USM Gulf Park campus showcased relevant information on the Ecosystem of Learning offered from our Coastal USM sites with an emphasis on organizational learning opportunities. Additionally, the research on the Impact of Emotional Intelligence on Employee Resilience delved into research findings highlighting the positive effects of emotional intelligence in navigating challenging work environments.

Jeepin’ the Coast, a prominent event along the Mississippi Gulf Coast in June 2023, attracted thousands. USM Gulf Park’s active participation included the distribution of nearly 700 promotional items, colloquially known as “duckies,” with a commendable scan rate to the USM Gulf Park campus webpage. This engagement strategy effectively heightened visibility and fostered connections within the local community.

The University continues to recruit high-quality students from across the Gulf Coast for successful academic journeys with the goal of offering coastal programs for coastal jobs for coastal people. Through dynamic course offering, a comprehensive recruitment strategy, and intentional marketing of academic programs, enrollment at Gulf Park will continue to grow. Through collaboration between Academic Affairs and the Office of Enrollment Management, dual-enrollment programs will continue to grow, along with a stronger strategy around transfer students and continued relationships with community colleges.

Executive Education Program

USM Gulf Park’s commitment to excellence extends beyond conventional academic offerings. The introduction of Executive Education programming exemplifies the institution’s dedication to providing cutting-edge curriculum, industry insights, and networking opportunities for executives and technically skilled professionals. Programs encompass professionally recognized technical credentialing, certifications, consultations, and content development, catering to mid-to-senior level influencers, managers, executives, technicians, engineers, researchers, and product innovators.

Director Named for New Executive Education Services



Stephanie McLendon has been named director of the new Executive Education Services on the Gulf Park Campus. A native of Mississippi, McLendon has extensive background in diverse training environments: global manufacturing, government, academia, private organizations, and independent consulting.

The trainings can be offered at the location that best fits the needs of audience—whether that means where the customer is located, on campus, or online. A vision of providing expertise and support to government, public, private and academia entities is a drive toward sustainability for the environment and the economy.

The Accomplishments of USM Gulf Park Campus Academic Affairs in 2023 stand as a testament to its unwavering commitment to academic excellence, community engagement, and the cultivation of impactful partnerships. From pioneering research presentations to the execution of successful community events and strategic collaborations, Academic Affairs has played a pivotal role in shaping the educational landscape on the Mississippi Gulf Coast. As the campus continues to innovate and expand its offerings, the future holds promising prospects for USM Gulf Park’s Academic Affairs.





School of Coastal Resilience



The School of Coastal Resilience (SoCR) connects the human experience of living on coastlines to the ideas, policies, and disciplines that shape the experience. Through research and instruction, we explore the dynamic between communities and the coastal environment.

DR. WESTLEY FOLLETT, Interim Director

Since its foundation in 2021, the School of Coastal Resilience continues to expand the number of academic programs it offers at USM's Gulf Coast campus. In addition to its support of long-standing programs in Biology and Biology Education, Chemistry, Criminal Justice, English and English Education, Film, Geography, History and History Education, International Development, Mathematics and Mathematics Education, Philosophy, Political Science, Physics, and Spanish, the School of Coastal Resilience offers the B.A. degree in Sustainability Studies and the B.S. degree in Sustainability Sciences (Coastal System Dynamics). For its development of the two last-mentioned new degree programs, the School was featured in the 2023 Sustainable Campus Index, a nationally recognized

publication by the Association for the Advancement of Sustainability in Higher Education. Earlier this year the School was approved to offer a new Sustainability minor.

The Gulf Scholars Program at USM, directed by Coastal Resilience faculty member **Dr. Rebecca Powell**, launched with seven initial cohorts of students. These undergraduate Gulf Scholars undertake mentored curricular, co-curricular, or extra-curricular experiences, such as work-study programs, research, and field work, to create a more just, equitable, and livable Gulf Coast. Pending final approval, the Gulf Scholars Program will also soon offer an undergraduate certificate compatible with any undergraduate major.

Thanks to a grant from the Mississippi Development Authority, the school will soon partner with a new **Center of Excellence** for digital and multimedia outreach. Working in collaboration with the undergraduate Film program and our Film faculty, the Center will provide production and technical services to clients addressing topics and issues relevant to people living in coastal and maritime settings.

Highlights

- **Dr. Douglas Bristol** (History) was honored at the Dale Center for the Study of War and Society by giving the 2023 Buford “Buff” Blount Professorship Lecture in Military History.
- **Dr. Westley Follett** (History) gave an invited lecture at the Royal Irish Academy in Dublin, Ireland, on a 15th-century Irish manuscript.
- **Dr. David Holt** (Geography) with Dr. Rachel Gisewhite (Center for STEM Education) are co-principal investigators for an almost \$500,000 grant from the National Academies of Sciences, Engineering, and Medicine to study “Youth Empowerment Multilayer Interconnectivity for Health and Community Resilience.” With colleagues from the School of Biological, Environmental and Earth Sciences and the School of Ocean Science and Engineering, **Holt** is also a co-principal investigator for the renewed grant project “Sediment Management for Compound Flood Hazards in Fluvial System,” with cumulative funding by the U.S. Army Corps of Engineers now in excess of \$1.5 million.
- **Dr. Tom Lansford** (Political Science) with associate editors **Dr. Bob Pauly** (Political Science), and **Dr. David Holt** (Geography) published the two-volume reference work *Political Handbook of the World 2022-2023* with Congressional Quarterly Press, and along with **Dr. Joby Bass** (Geography) individually authored as many as two dozen country entries apiece.
- **Prof. Vincenzo Mistretta’s** (Film) film “Medea” was selected as finalist for the best short film award at both the New Orleans International Film Festival and the Palermo International Film Festival.
- **Dr. Rebecca Powell** (English) published her article “From Artificial to Experience: A Kind of Freedom” in *English Education* 55 (2023), was awarded a \$150,000 “Leaders in Literacy” sub-grant from the University of Mississippi, through the Department of Education, and received renewed funding exceeding \$117,000 for the Gulf Scholars Program at USM, supported by the National Academies of Sciences, Engineering, and Medicine.
- **Dr. Deanne Stephens** (History) received a Mississippi Humanities Council grant to direct the Valena C. Jones Oral History Project in Bay St. Louis.
- **Dr. Jennifer Walker** (Biological Sciences), **Dr. David Holt** (Geography), and Dr. Rachel Gisewhite (Center for STEM Education), in partnership with the STEPS Coalition and the Boys and Girls Clubs of the Gulf Coast, received renewed funding from the National Academies of Sciences, Engineering, and Medicine for the five-year, \$970,000 grant project to develop an Environmental STEM Leadership Development program at Boys and Girls Clubs along the Mississippi Gulf Coast.
- Seven faculty (**Bristol, Follett, Franke, Holt, Powell, Stephens, Walker**) presented at academic conferences this year.
- Three faculty (**Bristol, Howe, Naquin**) received or further enhanced their pedagogical certification (e.g. ACUE, Excellence in Online Teaching, etc.)





School of Leadership

OUR MISSION: To develop and advance organizational leaders • To offer distinctive, competitive programs addressing emerging social, economic, and environmental challenges • To offer multi-disciplinary experiences that create transformational leaders • To conduct research that expands the knowledge base of business and technology

DR. HEATHER ANNULIS, Director

Undergraduate Programs

- Applied Technology B.A.S.
- Industrial Engineering Technology B.S.
- Industrial Engineering Technology (Logistics) B.S.
- General Business B.S.B.A.
- *New!* Organizational Leadership B.S.B.A.

Graduate Programs

- Human Capital Development M.S.
- Human Capital Development (Instructional Technology and Design) M.S.
- Human Capital Development Ph.D.
- Human Capital Development (Instructional Technology and Design) Ph.D.
- Instructional Technology and Design Graduate Certificate
- Logistics, Trade and Transportation M.S.

Specialized Centers

- **Center for Logistics, Trade, and Transportation** – provides applied research for the transportation and supply chain industries.
- **Workplace Learning and Performance Institute** – undertakes research and disseminates best practices in workplace performance.

Recent External Grants

- **Drs. Heather Annulis / Abu Haddud**
Accelerate MS Supply Chain Management Non-degree Certificate Program, \$102,000
- **Dr. Yuanyuan Zhang**
 - CDC project, collection of built environment data (e.g., sidewalks, crosswalks, green spaces, etc.) that are critical to promoting physical activities, \$127,697
 - US Department of Transportation (DOT), proving the concept of using machine learning techniques to collect transportation infrastructure data automatically from satellite images, \$129,954
 - Institute for Systems Engineering Research (ISER), investigating Mississippi inland ports' accessibility to regional markets (completed), \$114,749
 - National Rail Passenger Association (NRPA), developing tools to evaluate the socio-economic impacts of long-distance passenger railway services (completed), \$91,579

"Still Working 9 to 5"
Through a Women in Leadership grant, the School sponsors the first screening of this documentary at an academic institution in the U.S.

Guest Editor
Dr. Abu Haddud, Associate Professor of Industrial Engineering Technology, serves as guest editor for Industrial Engineering / Engineering Management Journal.

2023

J	F	M	A	M	J	J	A	S	O	N	D
<p>AHRD Conference Sixteen students from the Human Capital Development Ph.D. program present research at national conference in Minneapolis, MN.</p>	<p>Experience Business Casually Students from USM and local high schools meet with business volunteers to practice essential career skills.</p>	<p>Research Published Assistant Professor Dr. Bradley Winton and student Ka'Lon Duncanson publish research in Tourism in Marine Environments.</p>	<p>Artificial Intelligence Professor of Practice Dr. John Kmiec conducts a seminar on AI at the Southern Miss Educators' Retreat.</p>	<p>Commencement The School of Leadership confers 14 Ph.D. degrees, 23 Masters degrees, and 98 undergraduate degrees.</p>	<p>School of Leadership Awards Students are recognized for academic achievement, integrity, and peer support.</p>	<p>Coaching Accounting Professor of Practice Glenn Terry leads coaching sessions on audit quality in Luxembourg and South Africa.</p>	<p>Welcome Back Meet and greet for returning students with faculty, food and fun.</p>	<p>Oceans 2023 Four members of the SoL faculty present at the Oceans 2023 conference in Biloxi, MS.</p>	<p>Keynote Dr. Shuyan Wang gives keynote address at the International Chinese in Educational Technology Conference (SICET) in Orlando, FL.</p>	<p>Advisory Council The SoL invites business leaders to brainstorm ways to hone their programs to be more responsive to workforce needs.</p>	<p>Service Project The SoL collects donations for the Gulf Park Food Pantry. The response from faculty, staff, and students requires two trucks and six people to deliver.</p>

FACULTY FOCUS



DR. BHAGYASHREE BARHATE

Assistant Professor of Human Capital Development

Dr. Bhagyashree Barhate is an early career standout. Dr. Barhate's research has earned her a number of awards and grants, and she is already gaining quite a reputation in her field of study. Below are some of her notable achievements since her arrival in the School of Leadership from Texas A&M University.

- Awarded the Aubrey Keith and Ella Ginn Lucas Endowment for Faculty Excellence
- Presented multiple research papers at the Academy of Human Resource Development (AHRD) Conference in Minneapolis, Minn.
- Published a research paper in Human Resource Development Quarterly
- Presented three research papers at the University Forum for Human Resource Development Conference in Dublin, Ireland
- Served as an invited guest panelist at Rutgers Conference on Women in Hybrid and Remote Work in New Brunswick, NJ
- Acted as guest lecturer on work-family conflict at the University of Delaware
- Featured on the Academy of Human Resource Development (AHRD) Masterclass podcast, "HRD and the Great Resignation"
- Cited as an expert in a recent article about Gen Zers in the workplace
- Served as a reviewer for Human Resource Development International, European Journal of Training and Development, and Journal of Management Development
- Served as Proceedings Editor for the Academy of Human Resource Development (AHRD)

Advisory Council

Business leaders from across the Gulf Coast met with the School of Leadership in November, providing insight on ways to modify and expand its curriculum to prepare students for careers available here.



Keynote
Dr. Shuyan Wang gives keynote address at the International Chinese in Educational Technology Conference (SICET) in Orlando, FL.

Advisory Council
The SoL invites business leaders to brainstorm ways to hone their programs to be more responsive to workforce needs.

Southern Miss Cruisin'
The School of Leadership hosts the second annual afternoon of hot rods, music and lawn games on the Gulf Park campus during Cruisin' the Coast.

Discover Gulf Park
Students from area high schools visit the Gulf Park campus, and the SoL provides training on teamwork and leadership.

School of Leadership Retreat
Faculty and staff enjoy a day of team-building exercises, strategic planning, and student engagement strategies.

China
Professor of Management Dr. Fujun Lai presents research papers at four international conferences in China.

International
Dr. Bhagyashree Barhate presents three papers at the University Forum for Human Resource Development Conference in Dublin, Ireland.

UNDERGRADUATE STUDENT FOCUS



Ka'Lon Duncanson with Director, Dr. Heather Annulis

Ka'Lon Duncanson

Ka'Lon Duncanson can be accurately described as "a force of nature."

It was a force of nature that brought Ka'Lon Duncanson from Freeport, Bahamas, to the Gulf Park campus of Southern Miss after Hurricane Dorian destroyed his home in 2019. This became a defining moment in Ka'Lon's life.

Ka'Lon pursued a degree in marketing and made the most of his time at Southern Miss by throwing himself into campus life. He served as a vice president, then president, of the Student Government Association. Ka'Lon also founded the Fins & Flippers diving group, a social club that developed into an ocean conservation and stewardship organization.

Duncanson said, "During my childhood on the island, our elders consistently emphasized that 'effort reaps rewards.' I am continuously uncovering new facets of my capabilities and profoundly appreciate the guidance from all my professors at Southern Miss."

Duncanson earned his bachelor's degree in December of 2023. At fall commencement, Ka'Lon served as standard-bearer for the processional – a great honor he has undoubtedly earned.

ACCOMPLISHMENTS

- Vice-president of judicial affairs, Gulf Park Student Government Association
- President, Gulf Park Student Government Association (two terms)
- Member, Honors College
- Honors Keystone Scholar
- Participated in Study Abroad program in London, 2022
- Interned with Caterpillar in Washington, DC
- Student Employee of the Year, 2022
- People's Choice Award, School of Marketing Research Showcase, 2022
- Outstanding Gulf Park International Student, 2023

GRADUATE STUDENT FOCUS



Dr. Sajdak with Dr. Joe Paul, USM President

Dr. Brian Sajdak

Dr. Brian Sajdak was destined to soar with the eagles.

From a young age, Brian Sajdak was fascinated with flight. In fact, his decision on where to attend college was based on the institution's aviation school. After serving as a graduate assistant, where he learned how to teach students to be instructors, Brian hoped to eventually operate a training department for a major airline in addition to a career as a pilot.

Brian's first position as a pilot was with a major passenger airline, but he ultimately came to work for FedEx as a cargo pilot, where he remains today.

In 2019, Sajdak decided to explore Ph.D. programs to further his expertise in pilot training. He was referred to USM's Human Capital Development doctoral program during a campus visit at another university – an unconventional referral that brought him to the School of Leadership.

Not surprisingly, Sajdak's research focused on improving pilot performance and safety by understanding how they learn and by using human capital (employees) to improve both individuals and systems. He successfully defended his dissertation, titled Airline Pilot Situational Awareness Performance Improvement Through Imagery Practice, in the spring of 2023 to earn his Ph.D.

Since graduation, Sajdak published his research and is also co-authoring a paper with assistant professor of management Dr. Bradley Winton and former classmate Dr. Wendi Lord. Sajdak leads by example, and his research will no doubt continue to improve airline safety and pilot performance for many years to come.

ACCOMPLISHMENTS

- 2023 Outstanding Doctoral Student Award, College of Business and Economic Development
- 2023 Outstanding Doctoral Student in Human Capital Development, School of Leadership
- Volunteer pilot for Orbis International, a nonprofit that trains communities worldwide to combat preventable blindness

Faculty / Staff Awards

Dr. Heather Annulis
Director

Women in Higher Education Mississippi Network (WHEMN) Leadership Award

Dr. Bhagyashree Barhate
Assistant Professor

Peggy Jean Connor Award
Aubrey Keith Lucas and Ella Ginn Lucas Endowment for Faculty Excellence Award

Dr. Quincy Brown
Associate Professor

College of Business and Economic Development Outstanding Service Award

Dr. John Kmiec
Professor of Practice

2023 University Award,
Excellence in Online Teaching

Dr. Joyce Powell
Assistant Director

College of Business and Economic Development Outstanding Staff Award

Dr. Brad Winton
Assistant Professor

Business Advisory Council Research Award

ALUMNI SPOTLIGHT DR. GARY BURRUS



Dr. Burrus is executive director of the Choctaw Nation of Oklahoma's HR Department, which was recognized recently by *HRM Director* magazine as one of the "Best HR Teams in the USA." He is a graduate of the Human Capital Development Ph.D. program.

Faculty Research

27

PAPERS

23

PUBLICATIONS

46

CONFERENCE PRESENTATIONS



Human Resource Development Conference

Sixteen students and five faculty members presented research at the Academy of Human Resource Development Conference in Minneapolis, Minn., in February, 2023, representing the School of Leadership.

University Research Vessels

USM has a fleet of five research vessels. The use of large vessels at USM enhances and expands the high-quality education and research opportunities the university is able to provide as a leading marine science institution, while providing valuable benefits to our students, community, and associated marine economy.



Miss Peetsy B

The *Miss Peetsy B* is a 34-foot passenger vessel with a capacity of 34. The boat was originally donated to The University of Southern Mississippi by Jimmy Buffett and his sisters in honor of their mother. The vessel is used primarily by GCRL's Marine Education Center for outreach programs.

Sea Days: 47

Passengers: 2,029



R/V Jim Franks

The *R/V Jim Franks* is a 60-foot aluminum catamaran designed specifically to meet the needs of USM research and educational platforms. The vessel has a maximum capacity of 40 passengers and is equipped for both day cruises and overnight trips.

Sea Days: 87

Passengers: 1,406



R/V Ken Barbor

This year the *R/V Ken Barbor* became USM's first optimally crewed, fully autonomous vessel, equipped with a state-of-the-art computer vision and autonomous navigation system to facilitate research into vessel autonomy in congested coastal regions. The vessel is an Endeavor 48-foot aluminum passenger vessel with a capacity of six passengers, updated and refitted to serve as an offshore research vessel to support USM's School of Ocean Science and Engineering's deep ocean underwater surveys using various uncrewed maritime systems (UMS).

Sea Days: 39



R/V Tommy Munro

GCRL took delivery of the 97-foot *R/V Tommy Munro* in 1981. The vessel is used primarily for offshore research in the Gulf of Mexico and has been a platform for the Southeast Area Monitoring and Assessment Program (SEAMAP) for decades.

Sea Days: 63

Passengers: 49



R/V Point Sur

Built in 1980, the *R/V Point Sur* is a 135-foot-long vessel accommodating 16 researchers and technicians and a crew of eight, while housing a 1,110-square-foot deck that includes a primary and wet laboratory. This ship is maintained to safety standards required for vessels in the U.S. academic research fleet.

Sea Days: 174



New Positions in SOSE



DR. CHRIS HAYES

Interim Associate Director of SOSE, with chief responsibility for the Division of Marine Science



DR. JORIS VAN DER HAM

Interim Associate Director of SOSE, Undergraduate Programs



DR. ROBERT LEAF

Interim Director of the School of Ocean Science and Engineering - he will continue to serve as Associate Director of SOSE, Coastal Sciences division.



DR. ROBERT LEAF
Director

School of Ocean Science and Engineering

The School of Ocean Science and Engineering harnesses elements from key areas of The University of Southern Mississippi, including the Division of Coastal Sciences at the Gulf Coast Research Laboratory (GCRL) in Ocean Springs, the Division of Marine Science at the John C. Stennis Space Center in Hancock County, and the Gulf Park campus, to create a regionally, nationally, and internationally recognized leader in marine and coastal science.

Professor Receives Funding to Research Blue Crab Discard Mortality

Dr. Zachary Darnell, an associate professor, was funded by the National Oceanic and Atmospheric Administration (NOAA) to analyze strategies to reduce discard mortality in the blue crab fishery.

Funding for the project began at the beginning of September 2023, titled "Quantifying and Reducing Discard Mortality of Undersized and Ovigerous Crabs in the Gulf of Mexico Blue Crab Fishery" in a collaborative effort with Mississippi State and the University of South Alabama. USM will lead the project and work with the local fishing community to determine mortality among discarded crabs and to find a solution to the growing concern of discard mortality.



Partnership

USM is partnering with Louisiana State University (LSU) and Tulane University through the Mississippi River Delta Transition Initiative (MissDelta), a \$22 million, five-year project that includes 38 investigators who will seek strategies to promote sustainability of the marine ecosystem for the northern Gulf Coast.

Innovative Research

The MissDelta initiative is focusing on the continual land disappearance of the Louisiana Bird's Foot Delta, where the Mississippi River meets the Gulf of Mexico, anticipate coastal changes over the next decades, and evaluate best management responses. Associate Professor Dr. Kim De Mutsert is the project's lead representative for the University.

AWARDS

- **Kelly San Antonio** won the first place in Student Oral Presentation at 2023 Mississippi Water Resources Conference.
- **Kelly San Antonio** and **Jennifer Holifield** won travel scholarships to attend the first annual training and

developers conference organized by Cooperative Institute For Research to Operations in Hydrology.

- The Marine and Estuarine Graduate Student Association (MEGSA) was awarded the USM Gulf Coast Outstanding Student Organization Award at the USM Awards Day
- Undergraduate student **Devan Hildebrand** won the award for Best Community Engaged Research at the USM Undergraduate Student Symposium
- Master's student **David May** was awarded the Nick Baron Memorial Marine Science Education Endowment Scholarship.
- **Kelly San Antonio, Lindsay Bomgardner, James Klein, Hailee Nigro** and **Calvin Chee** were all awarded a \$500 COA Travel Award.
- **Hailee Nigro** received a \$6,500 Ruth D. Turner Scholarship in Marine Biology
- **Dr. Shannan McAskill** received a Staff Development Award
- Graduate student **Shihab Hossain Saran** received first prize award in student poster competition at OCEANS 2023 conference. Graduate students **Olagoke**

Daramola and Hameed Ajibade were also finalists in the competition.

- **Betina Brockamp, Toluwani Akande, Luis Altamirano Perez, Musa Animashuan** were all awarded scholarships from the Marine Technology Society at Oceans 2023
- **Dajaneir Thompson** received a Staff Development Award of \$1,000
- **Corey Chamblee and Traver Whalen**, Ocean Engineering students have been awarded the Eagle Scholars Program for Undergraduate Research (Eagle SPUR)
- **Luis Altamirano Perez** received the College of Arts and Sciences Graduate School Proposal Project Award

- **Dr. Zachary Darnell** was awarded the Butch Oustalet Distinguished Professorship Service Award
- **Johnson Oguntuase, Uchenna Nwankwo, and Stephan Howden** received the Nav-Experience Award for the best peer-reviewed technical paper at the International Federation of Surveyors (FIG) Working Week. FIG is one of the three organizations on the International Board of Standards of Competence of Hydrographic Surveyors and Nautical Cartographers (IBSC). The other two are the International Hydrographic Organization (IHO) and the International Association of Cartographers (ICA).



Uncrewed Maritime Systems (UMS)

Six students received their certificates after successfully completing USM's UMS Tier 1 Certification Program.



The five-week program provides students with a better understanding of the blue economy and UMS. The program consists of four courses, including one laboratory course, for a total of 10 credit hours. Course content includes basic electronics, oceanography, acoustics, communications, navigation, and sensors with a focus on uncrewed undersea, surface and aerial vehicles. The laboratory course emphasizes electronics and features the construction of an underwater buoyancy glider. During the final week, students race their completed buoyancy gliders against one another.



Summer Field Program

For more than 75 years the Summer Field Program (SFP) has served as a link between GCRL and a broader community. Through its affiliate program, over 60 colleges and universities maintain formal agreements that facilitate students taking courses at GCRL while seamlessly earning course credit at their home universities. Students and instructors outside of the network also participate in SFP. Alumni of SFP occupy positions in academia, research, industry, and government around the world. Many return to teach at SFP. In 2023, 83% of instructors and staff were

alumni. Over 70 graduate and undergraduate students from 11 states earned 569 hours of credit in the field-intensive, research-oriented courses. As always, GCRL vessels including the R/V *Jim Franks*, the *Miss Peetsy B* and a fleet of small boats carried students to otherwise inaccessible field sites. Students immersed themselves in learning by tagging sharks in the Northern Gulf of Mexico, exploring rehabilitation centers and marine sanctuaries, banding birds with Audubon experts, monitoring dolphin habitats, and camping on a barrier island. Learn more at usm.edu/sfp.

2023 COURSE OFFERINGS

JUNE TERM

- Elasmobranch Biology
- Marine Science II: Marine Biology
- Barrier Island Ecology
- Cetacean Behavior
- Research Study Program
- ONLINE Marine Mammals

JULY TERM

- Marine Science I: Oceanography
- Marine Ichthyology
- Marine Ecology
- Marine Conservation
- ONLINE Marine Toxicology



Center for Fisheries Research and Development



Scientists at the Center for Fisheries Research and Development (CFRD) develop and conduct research that informs resource management. We work with state, federal, and community partners to ensure that we understand scientific fishery needs and focus our research efforts on how we can promote sustainable fisheries and habitats. Our staff not only conduct the research, but also sit on local, regional, and federal assessment panels to ensure our data is efficiently transferred to management entities.

JILL HENDON, Director

2023 Highlights

Whale Shark

The largest fish in the ocean, the whale shark was a key project for CFRD research in 2023. Although CFRD has been studying the whale shark for a decade, a new collaboration with BOEM, BWRI, and NOAA is allowing the center to look at the movement of these fish in the context of how future alternative energy farms in the Gulf of Mexico could impact

it. This year proved to be interesting for whale sharks study, as they showed up in the panhandle of Florida, something that had not been seen since 2009. CFRD was able to satellite tag 10 whale sharks to continually monitor their movements. This information will help inform future energy development plans in the Gulf.



Tripletail

CFRD has been working on a collaborative effort with the Gulf States Marine Fisheries Commission and the Mississippi Department of Marine Resources to determine the migration patterns of Atlantic tripletail. In recent years, this species has become popular with sport fish anglers. CFRD hopes to better understand their movements so that population trends can be monitored. Through this collaboration, the team has acoustically tagged tripletail in the Mississippi Sound and in overwintering grounds in the Florida Keys. The acoustic array along the continental shelf and the help of anglers have allowed CFRD to track how and when these fish move between the two regions.



Billfish

CFRD is currently conducting billfish research in the Gulf of Mexico, eastern Pacific ocean, and Atlantic ocean to aid in management efforts. CFRD's long-standing relationship with the recreational fishing community and The Billfish Foundation has allowed us to continue collecting reproduction, diet, and age data on these species.

In 2023 we coordinated the tagging of five Gulf of Mexico blue marlin with satellite tags. We are currently monitoring the movements of these marlin as well as the movements of 15 striped marlin that we tagged in 2022 in the Pacific in cooperation with Costa.



CFRD Internship

CFRD hosted an undergraduate intern from Alcorn State University as part of its Minority Science and Engineering Improvement Program (MSEIP) coordinated through USM's Marine Education Center. This program offers STEM opportunities early in the college career to help promote career pathways. Andjule Davis, a native of Chicago, Illinois, worked with CFRD on a Black Drum age and growth project. Davis was able to collect and process fish, analyze the data, and present her research at the MSEIP seminar day.



Gulf Coast Geospatial Center



The Gulf Coast Geospatial Center (GCGC) works with federal, state, commercial and academic partners in research, development and applications of precise geospatial data, remote sensing, and computational tools and models to enhance the understanding of relative sea level rise and its impacts, coastal change over time, and nature-human dynamics in the coastal system.

DR. GREG CARTER, Director

In 2023, the Gulf Coast Geospatial Center conducted research investigating coastal ecosystems and geomorphology, natural coastal hazards, and geospatial and geodetic data, tools, and models, while maintaining critical infrastructure needed to enhance the National Spatial Reference System (NSRS) and provide precise geospatial positioning capabilities across the state of Mississippi.

Critical Infrastructure

The GCGC continues to operate and maintain the statewide network of Global Navigation Satellite Systems (GNSS) Continuously Operating Reference Stations (CORS) allowing for real-time position corrections and the downloading of historical static CORS data from rtn.usm.edu. In 2023, the GCGC continued to upgrade CORS receivers to allow static logging of additional satellite constellations.

Research Activities

GCGC research and applications promote an understanding of the linkages among natural and anthropogenic processes along the Mississippi Gulf Coast and adjacent environments.

- Co-located topographic surveys, salinity monitoring, bathymetric data collection and image analysis are in progress to characterize estuarine elevation thresholds and quantify habitat change over time in Mississippi estuaries. Sixteen field surveys were conducted and nine salinity logging stations were monitored. Results were presented at the 2023 MS AL Bays and Bayous Symposium and the Mississippi Academy of Sciences Annual Meeting.
- To improve understanding of sedimentation rates associated with seasonal flooding in levee-controlled areas, GCGC researchers collaborated with the USM School of Biological, Environmental and Earth Sciences and

the U.S. Army Corps of Engineers Engineer Research and Development Center (USACE-ERDC) to provide controlled geodetic data and analysis (static GNSS, terrestrial LiDAR and leveling surveys) in inter-levee areas of the Mississippi River in the St. Catherine Creek National Wildlife Refuge and the Phil Bryant and Mahanna Wildlife Management Areas.

- Quarterly dune morphology and vegetation monitoring was conducted in collaboration with USACE-ERDC at Henderson Point in Pass Christian, MS using terrestrial LiDAR, high-resolution multispectral UAS imagery, and precise leveling surveys. The project will improve understanding of the impacts of beach grooming regimes on beach dune volume, accretion, and vegetation change over time.
- GCGC researchers provided geodetic control and remote sensing support for projects and monitoring programs led by the USM Marine Science, Hydrography, and Coastal Sciences programs as well as the Grand Bay National Estuarine Research Reserve. Collaborative efforts included the collection of UAS imagery, acquisition of precise GNSS measurements for Surface Elevation Tables, survey benchmarks, and hydrological monitoring installations, and other GNSS and leveling surveys to augment collaborative research efforts.

CORS

Registered user accounts for the USM GCGC CORS network continued to grow, with 307 new users registered for a total of 2,676. Real time and historical data access is provided to the public at no cost at rtn.usm.edu.



- Over 49,000 hours of fixed GNSS positions were provided to end-users in the field.
- 34 of the 53 USM GCGC CORS are now equipped with Beidou and Galileo static logging capabilities.
- Testing and evaluation are underway to assess the impacts/improvements of new constellations (Galileo and Beidou) on precision, accuracy, stability and canopy penetration for network-corrected GNSS solutions.

Student Accomplishments

The GCGC provided graduate research assistantships for two master's students. Graduate student research included quantifying the effects of bathymetric change on modeled storm surge heights and investigating the impacts of ground height estimate accuracy on the modeled economic impacts of tropical cyclones.

Master's student Sydni Crain presented her research at the 2023 Mississippi Academy of Sciences annual meeting, where she was awarded third place in the Geology and Geography Student Presentation Competition.

One thesis was submitted to the Graduate School:

- Crain, Sydni. (2023). *Understanding the impacts of topobathymetric data on storm surge model predictions* (965). [Master's thesis, The University of Southern Mississippi].

Outreach

During 2023, USM GCGC staff disseminated scientific results, tools, and concepts to K-12, university, and community audiences through interactive demonstrations, classroom visits, and conference presentations and informative booths. Conference participation included the MS AL Bays and Bayous Symposium, the Mississippi Academy of Sciences Annual Meeting, OCEANS 2023, and the Mississippi Geospatial Conference. Other highlights include:

- Presented an interactive demonstration at STEAM Night at Bayou View Elementary School (Gulfport, MS), discussing the use of geospatial technologies for monitoring the coastal environment with students and parents
- Gave demonstrations and lessons at Science Week at Oak Park Elementary School (Ocean Springs), where staff visited third-grade classes to discuss and demonstrate topics in coastal geography, including GNSS, the NSRS, and geospatial tools for mapping, modeling, and researching the coastal environment
- Discussed the importance of geodetic and geospatial sciences with GenSea high school STEM interns and gave an interactive demonstration of GNSS data collection and Total Station and Terrestrial LiDAR operations
- Showcased GCGC research and UAS applications at USM Black and Gold on the Blue at USM's Gulf Park Campus and the Thunder over the Sound Air & Space Show at Keesler Air Force Base



Hydrographic Science Research Center



The Hydrographic Science Research Center (HSRC) was established in 2001 to assess emerging trends in hydrography and implement the most promising trends into operational use. The HSRC has provided innovative solutions for hydrographic surveying, precise positioning, water level measurements, sensor development, and novel uses for hydrographic data.

DR. STEPHAN HOWDEN, DIRECTOR

In 2023, the HSRC continued to be involved in a range of hydrography and ocean mapping research projects from the shallow coastal ocean to exploration of the deep open ocean, research in tides and geodesy, and marine spatial data infrastructure/information. Partnerships enabling much of this research included the NOAA Ocean Exploration Cooperative Institute (OECI), the Gulf of Mexico Coastal Ocean Observing System, USM's Roger F. Wicker Center for Ocean Enterprise, the Gulf Coastal Geospatial Center, USM's Marine Education Center (MEC), and the academic programs within the School of Ocean Science and Engineering. Private sector partnerships included L3Harris/ASV, Leidos, Impossible Sensing, Integral Consulting, Sandpoint Hydrographic LLC, and TCARTA.

HSRC added USM SOSE research associate professor Leonardo Macelloni, who serves on the Council of Fellows for OECI, as the associate director and Dr. Erica Luzzi as a postdoctoral fellow.

The HSRC is actively pursuing ways of increasing collection and processing throughput of mapping data, and fusion of that data with existing information products, using statistical methods, artificial intelligence, deep and machine learning. In 2023 the HSRC embarked on its first such funded project led by Dr. Macelloni, and his colleagues at University of Louisiana

at Lafayette and Woods Hole Oceanographic Institution, for a project on advancing the autonomy of autonomous underwater vehicles and co-exploration using machine learning.

The Center entered in a five-year cooperative agreement with the Bureau of Ocean Energy Management Office for Strategic Resources to characterize ecological conditions of seabed critical minerals. The first-year effort is focused on assessing the critical minerals potential of brine pools of the deep Gulf of Mexico. Dr. Luzzi, a planetary geologist, will be working on this project, which includes a partnership with the space exploration company Impossible Sensing to conduct the first at-sea trials of InVADER, a novel Raman spectrometer developed for planetary exploration, that will be used in this case for detecting sediment composition, including critical minerals.

Pursuant to the 2022 Memorandum of Understanding with the Nippon Foundation GEBCO Seabed 2030 Project that was signed by USM, the HSRC continues efforts to contribute data to the project, which will help enable a comprehensive digital representation of the ocean.

The HSRC continued its efforts for the Natural Resource Damage Assessment and Restoration (NRDA) to study and monitor the long-term effects on the Deepwater Horizon/ oil

spill on the Mesophotic and Deep Benthic Communities (MDBC). This project is intended to last for 7-8 years and have four components. The HSRC is providing the leadership role in component 1: Mapping, Ground-Truthing, and Predictive Habitat Modeling; and in component 2: Habitat Assessment and Evaluation, by developing and deploying seafloor landers to monitor environmental parameters at the MDBC. In 2023 HSRC deployed and recovered landers for this project.

The HSRC's WAM-V 16, a fully electric USV with articulating pontoons that help keep the instrumentation platform steady when the vessel is underway in wind-driven waves, was upgraded with a new communications system, more powerful electric outboard motors, and other performance upgrades. This will enhance research that can exploit the capabilities of this platform.

Dr. George Raber utilized the Wingtra Uncrewed Aerial System, acquired for an HSRC project, for other funded work in the S. Pacific at Palmyra Atoll. In addition to the data collection, a manuscript has been worked on using prior years data collection missions for submission to a journal for publication.

The HSRC's work in tides and geodesy continued with an ongoing study of the water level variations on Titicaca lake and compare the tide gauge data with data from satellite altimetry. Dr. Jigena-Antelo presented the work at the U.S. Hydro Conference in March, 2023. Dr. Oguntuase presented a paper on using mass-market, specialized GNSS to vertically reference bottom pressure measurements of sea level at the International Federation of Surveyors (FIG) working week in Orlando, FL. The paper, co-authored by USM alumni Dr. Uchenna Nwankwo and Dr. Stephan Howden won the award for the best peer-reviewed paper of the conference. The paper is published in the proceedings of the conference.

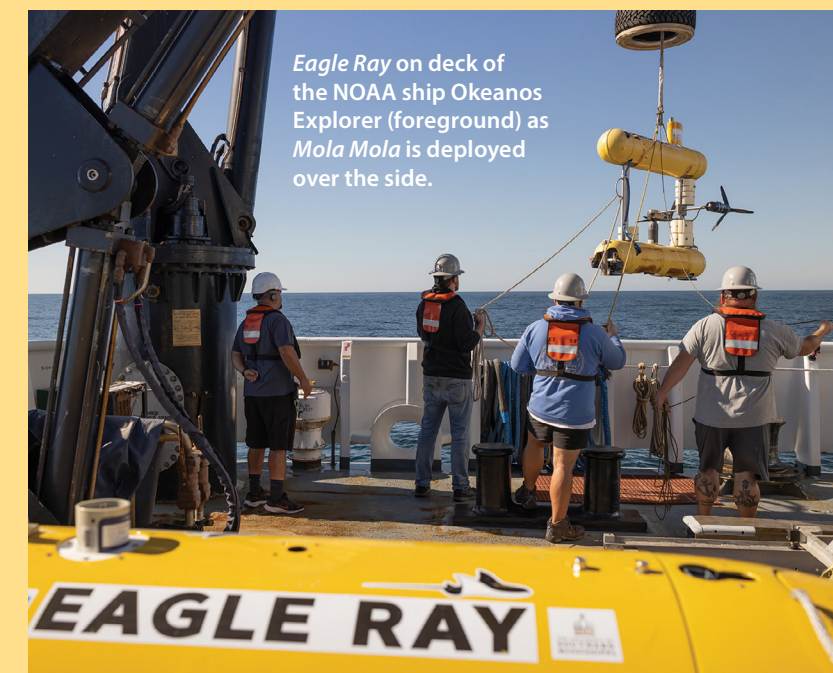
Educational partnerships are important to the mission of the HSRC. It works closely with the hydrographic science, marine science, ocean engineering and geography programs at USM, providing graduate research assistantships and undergraduate research and work study opportunities. In 2023, the HSRC supported 7 graduate research assistants. The MEC is also an important HSRC partner and the HSRC is committed to the mission of the MEC and to providing relevant information and expertise for its endeavors. This past summer, Kya Coleman, an undergraduate student from Tuskegee, joined the HSRC as part of an MEC project funded through the OECI to be trained on seafloor mapping methods and hydrography charting. She worked with a dataset from the Mountain Top Bank in the Gulf of Mexico.

Important Milestone Reached

A major milestone was reached with the HSRC's deep AUVs when the last of the instrumentation and parts for the Eagle Ray and Mola Mola were received in late September 2023. The new VOYIS LASER imager and high-definition video camera, battery system, and new instrumentation housings for the AUV *Mola Mola* were received by the HSRC. In October the *Eagle Ray* and *Mola Mola* were taken on a short engineering cruise on the USM R/V *Point Sur* in the Gulf of Mexico. The team then shipped them to San Francisco for a NOAA-funded mapping project offshore California. The EXpanding Pacific Research and Exploration of Submerged Systems (EXPRESS) campaign was carried out by two Okeanos Explorer research Cruises.

Both HSRC AUVs were extensively used during the cruises. *Eagle Ray* broke its depth record surveying portion of the Rodriguez Seamount at 1950 m water depth (the previous depth record was 1650 m) in the Gulf of Mexico. The first georeferenced photomosaic from the VOYIS on the *Mola Mola* were collected and processed, though the LASER system did not operate correctly, and requires shipping back to the manufacturer for service.

In the third year of the project, the HSRC is leading with L3Harris/ASV, Integral Consulting and the Gulf of Mexico Coastal Ocean Observing System to develop a capability to monitor hypoxia in the northern Gulf of Mexico using uncrewed surface vessels (USV), an offshore mapping demonstration was conducted in August. The *Sea Eagle*, the HSRC's C-Worker 5 uncrewed surface vessel, along with a similar vessel from L3Harris, conducted the first uncrewed mapping of hypoxia in Louisiana waters in the region known as the "Dead Zone."

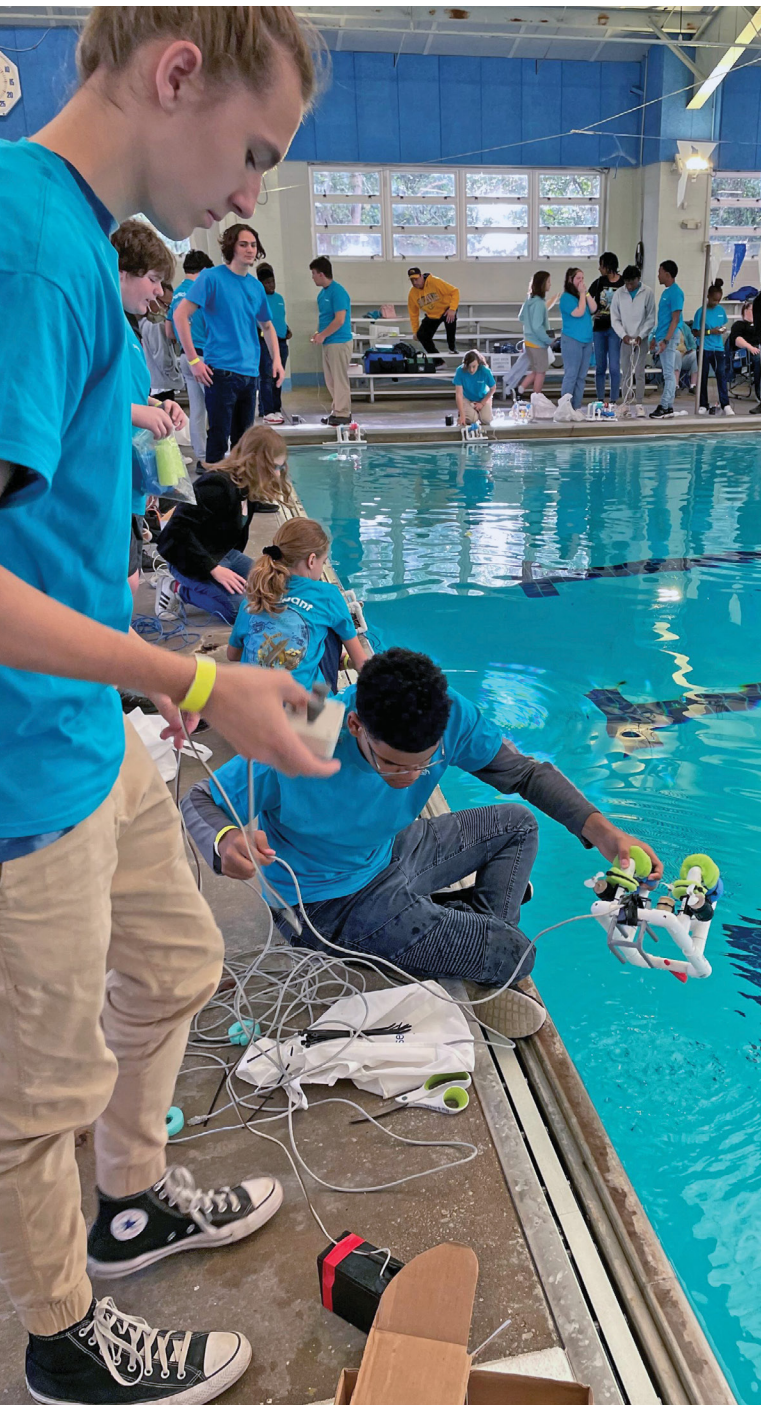


Marine Education Center



The Marine Education Center works across Coastal USM to engage members of diverse communities in ocean sciences, promoting careers and fostering community involvement through formal and informal education programs that provide participants with a better understanding of the Gulf of Mexico.

DR. JESSICA KASTLER, Director



Partners in STEM

The MEC works with Coastal USM researchers to disseminate their results through experiential education, encouraging students to enter careers in ocean science, technology, and exploration. Sponsors broaden accessibility by allowing us to offer programs at no cost to participants. College and K-12 students explored uncrewed systems with scientists from the School of Ocean Science and Engineering and the Roger F. Wicker Center for Ocean Enterprise. One of the ways they did this was the SeaPerch Regional Challenge, in which K-12 student teams built remotely operated vehicles to compete in water-based obstacle courses at the Biloxi Natatorium.

Informal Marine STEM Education

Immersive K-12 educational programs are aligned to Mississippi State Science Standards in several subjects, so visiting teachers can tailor their experience as needed. Opportunities accommodate a range of time and budget constraints. The MEC hosted five teacher workshops, 41 groups on day trips and 37 groups in retreat-style programs lasting several days, during which students stayed in dormitories. The Louie and Terry Ehrlich STEM Endowment supported an educational cruise aboard the *Miss Peetsy B* at no cost to 259 students from Trent Lott Academy in Pascagoula.



Undergraduate Mentoring

The MEC offers undergraduate summer interns and their research mentors a comprehensive program of professional development, career awareness, and social engagement that fosters a sense of belonging among participants from groups that are historically excluded in the ocean sciences field. Ten students from Tuskegee University were mentored during internships at University of New Hampshire, University of

Rhode Island, Woods Hole Oceanographic Institution, the Ocean Exploration Trust, and USM through NOAA's Ocean Exploration Cooperative Institute. In addition, the MEC provided personal and professional development support to two students from Xavier University in New Orleans and four students from Alcorn State University during their research internships at USM.

Summer Camps

Each year the MEC's week-long summer camps create magical moments and memories that last a lifetime. This year, 203 Sea Campers learned about surprising natural processes that lead to the "Magic of the Ocean" through demonstrations related to salinity and pH, and observations of plants and animals. During SharkFest, 30 campers, in grades 7-12, tagged sharks in the Mississippi Sound with partners at the Center for Fisheries Research and Development. During Shaggy's Angler Camp, 29 campers learned tips, tricks, and techniques for catching fish along the northern Gulf. Thanks to support from Shaggy's, campers went on a deep-sea fishing trip to catch red snapper.

Science Café and Gunter Library Partnership

The MEC continues to facilitate the online broadcast of the GCRL Science Café, which is hosted by Gunter Library. 284 people attended the 11 sessions either in person or via Zoom/Facebook Live. Gunter Library also partnered with the MEC to create a resource list about climate change and severe weather events. The list includes children's and young adult books, movies, documentaries, games, and relevant websites.



Roger F. Wicker Center for Ocean Enterprise

The Roger F. Wicker Center for Ocean Enterprise is a global hub for Uncrewed Maritime Systems (UMS), ocean data science, maritime cyber research, and training for Mississippi's emerging blue tech workforce. The Center consists of multiple facilities bringing together federal, industry and academic partners, creating a collaborative environment to accelerate the development and launch of new technology in the fast-growing ocean economy.

2023 Highlights

Over the past year, the Marine Research Center (MRC) welcomed numerous state, federal, and private industry guests to take advantage of the Center's many resources. Equipped with a classroom, conference room, electronics lab, marine tech lab, deep water test tank, prototype fabrication shop, and indoor/outdoor storage, the MRC met a variety of customers' needs. The MRC also supported multiple research development test and evaluation and training efforts using USM's R/V *Point Sur* and R/V *Ken Barbor*. A highlight of the year was the use of the MRC to support the Navy's 2023 Advanced Naval Technology Exercise (ANTX) at the Oceans2023 Conference. Over 400 participants from the Navy, NOAA, Academia, and Industry spent an entire day presenting vignettes in Operational Oceanography and Uncrewed Systems.

Of note, the MRC's newly completed prototype fabrication shop provided a variety of services to internal and external customers with products ranging from rapid 3D printing jobs to highly detailed 5-axis CNC milled custom prototypes. Outfitted with \$1.8 million in RESTORE Act-funded equipment, the shop touts an impressive array of CNC and manual equipment. The CNC equipment

includes a 5-axis milling machine; lathe; plasma table; and a hybrid laser/router table. Manual equipment includes a mill; lathe; slip roll; saws; drill press; iron worker; MIG/TIG welding; and a hand-held laser rust remover. A notable feature of the shop is its proximity to the Gulf of Mexico--users can build, modify, or repair their marine equipment in a timely manner and get back on the water with minimal delay.

As a result of a grant to Ocean Enterprise from AccelerateMS, The MRC also hosted over 200 guests from all over the world for four open enrollment maritime training programs (Maritime Data Analysis, Maritime Autonomy, Maritime Uncrewed Systems and Maritime Cyber. The program was extremely successful and provided hard-to-obtain upskilling for learners from active, guard, reserve and transitioning military, community college students, the offshore energy and coastal tourism sectors.

Ocean Enterprise successfully led and completed a three-year program for the Department of Homeland Security that integrated research from three Universities, four government agencies and four industry partners. The final demonstration of the developed acoustic tracking capability using maritime uncrewed systems included six crewed and five uncrewed vessels in the Gulf of Mexico.



The MAHI Sense product has us assemble a very capable autonomous USV for ocean research in improved littoral autonomy in a short period of time. Even before their team landed in the U.S., they worked with us to provide detailed guidance in the selection and dimensioning of components as well the actual integration support for this custom USV. We couldn't be happier with our partnership with Team Mahi.

JASON MCKENNA, Director of Research, Development, Testing, Evaluation & Training at the Roger F. Wicker Center for Ocean Enterprise

Center Partners with MAHI to Study Physical Processes in Northern Gulf of Mexico

The Roger F. Wicker Center for Ocean Enterprise has partnered with MAHI to integrate the MAHI Sense, on a USM platform to create a fully autonomous surface vessel to study oceanographic processes in the Northern Gulf of Mexico.

The vessel is a small draft RIB intended for shallow water surveys and monitoring activities. It can be easily deployed from shore or a mother vessel and serves as an excellent platform for blue-tech demonstrations, research and workforce training for helping create an applicant-ready pool of candidates for Mississippi's emerging uncrewed systems industry.



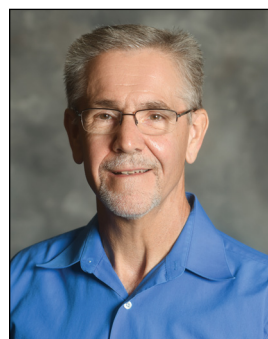
NEW RESEARCH PROGRAMS FUNDED IN 2023 that further Ocean Enterprise leadership in the new Blue Economy, Blue Technology, Ocean Data Science, and Maritime Uncrewed Systems



- Improving Magnetic Gradiometers for UUVs **\$8M, ONR**
- Maritime Unmanned Systems Technology **\$1.3M, DHS S&T/ Naval Research Lab**
- Measuring Hypoxia in the Gulf of Mexico **\$514K, NOAA**
- Maritime Training **\$983K, AccelerateMS**
- Environmental Characterization of Potential Deep Water Carbon Sequestration Sites **\$37K, Carboniferous Inc.**
- Maritime Port Security **\$876K, Radiance Technology**
- Strengthening Academic and Federal Laboratory Collaboration: Enhancing Multi Domain Operations: Aerial/Riverine **\$50K, Mississippi's IHL**

STAFF - 34 | GRADUATE STUDENTS - 8 | GRANT PROPOSALS - 19 | ACTIVE GRANTS - 14

Thad Cochran Marine Aquaculture Center



The Thad Cochran Marine Aquaculture Center (TCMAC) is an advanced research unit centrally located in the northern Gulf of Mexico in Ocean Springs, at the Gulf Coast Research Laboratory's Cedar Point research site. Our research focuses on alleviating the bottlenecks that constrain the production of marine species. We work with industry, government and non-profit organizations to advance sustainable aquaculture on land and in coastal and marine environments.

REGINALD BLAYLOCK, Director

In 2023, Thad Cochran Marine Aquaculture Center had 38 staff (18 full-time, 11 part-time, one part-time retired, and eight graduate students). In 2023, TCMAC investigators wrote or co-wrote 19 grant proposals. Of grants awarded, \$1,381,139 came from federal lines and \$2,113,287 came from general funds. TCMAC had 14 active grants in 2023. TCMAC provided \$808,425 in direct support (financial match, facility usage, and resources). Members presented 10 oral and poster presentations and participated in numerous outreach and service activities.

Production and Research Highlights

Oysters (*Crassostrea virginica*)

Over 170 million eyed diploid larvae, 1 million triploid larvae, and more than 1.7 million single seed oysters were produced. Over 1 million single set oysters and 2.47 million eyed larvae were sold to industry. 148.8 million eyed larvae and 320,000 seed were transferred to MDMR for spat-on-shell oyster reef restoration and off-bottom aquaculture. TCMAC provided 120-180 million pediteligers to the

State. Projects investigated the effects of carbonate chemistry on survival and growth of oyster

larvae in culture (NOAA) and Selection of Aquaculture Lines with improved Traits (SALT), a Gulf Research Consortium project to produce improved gulf oyster genetic lines. TCMAC was represented on the Nature Conservancy's Technical Advisory Team for Oyster Shell Recycling Workshops and the Advisory Committee for Oyster Robotics S3AM project (University of MD). Service agreements and extension efforts to support the gulf-wide off-bottom oyster culture industry continued.

Spotted Sea Trout (*Cynoscion nebulosus*)

Over 90 million fertile sea trout eggs were produced. TCMAC produced 1,500 juvenile fish for transfer to Ocean Springs and Moss Point High Schools and grew approximately 36,000 juvenile seatrout received from the Mississippi Department of Marine Resources (MDMR) to the 6-8 inch size for release (26,000 released by the end of 2023). Work to develop partnerships for commercial grow out of seatrout with the private sector continues.

Red Drum (*Sciaenops ocellatus*)

Over 1.7 million fertile eggs were produced. TCMAC seeks to improve zootechnical performance of juveniles in recirculating aquaculture systems for use in an Integrated Multitrophic Aquaculture system. Work to develop partnerships for commercial scale grow-out of red drum with the private sector continues.

Algae (*multiple species*)

An average of 4.35 trillion cells a day of live microalgal feedstock (70g/day relative biomass yield) was maintained. *Chaetoceros calcitrans*, *Chaetoceros muelleri*, *Pavlova lutheri*, *Tetraselmis* sp., and *Tisochrysis lutea* were produced using batch cultivation and semi-continuous (photobioreactors) methods. Optimization of *Chaetoceros muelleri* in 25 L PureBiomass photobioreactors was initiated to establish baseline productivity and to reduce nutrient carry-over. Land-based cultivation of the macroalgae Graceful Red Weed (*Gracilaria* spp.) was established to support an Integrated Multitrophic Aquaculture project. An outdoor field lab and algal pad with binary water treatment systems were completed and preliminary baseline trials were successfully completed.

Tripletail (*Lobotes surinamensis*)

A small inventory of adults was maintained under a photothermal schedule to advance and improve reproductive maturation and production protocols. Ongoing research will focus on zootechnical performance improvements for year-round pilot-scale production in recirculating aquaculture systems. Work to develop partnerships for medium and commercial scale growout with the private sector continues.

Mutton snapper (*Lutjanus analis*):

Mature Mutton Snappers were collected near Key West, FL and gamete samples were preserved for individual cell sorting, genotyping, and building a linkage map of the genome. The genome was sequenced using the PACBIO Hifi and illumina sequencing platforms. Data are being processed to produce a draft reference genome assembly.

Nearshore and Offshore Aquaculture

The project with Manna Fish Farms, LLC, University of New Hampshire, University of Mississippi, NOAA/NCOOS Coastal Aquaculture Siting and Sustainability, and the federal inter-agency working group to move the offshore permit process forward awaits the results of the inter-agency review of the application. Work also continued on a nearshore Integrated Multitrophic Aquaculture demonstration, research, training, and outreach project with Dauphin Island Sea Lab, University of New Hampshire, Mississippi-Alabama Sea Grant, and NOAA/NCOOS Coastal Aquaculture Siting and Sustainability Office. The site was selected and current/temperature data were collected to guide pre-engineering of the mooring and containment systems. A baseline environmental monitoring plan was developed.

Amyloodinium ocellatum

The live-culture of *Amyloodinium* was maintained to supply parasite material as part of an ongoing project with Live Bait Advantage, LLC to develop an antigen-based, rapid diagnostic test for the parasite. The test awaits validation.

Student Support and Mentorship/Training

- Eight Graduate Assistantships (SOSE, COA)
- Eleven Career Technical Education (CTE) students from Ocean Springs High School
- Five GenSea-sponsored high school interns

COA Graduate Assistantships Supported

- Caitlyn Fontenot, M.S. under Dr. Reginald Blaylock
- Jasmine Hall, M.S. under Dr. Reginald Blaylock
- Paul McDonald, M.S. under Dr. Eric Saillant
- Lora Holman, M.S. under Dr. Eric Saillant
- Tami Hildahl, Ph.D. under Dr. Eric Saillant
- Heather King, M.S. under Dr. Eric Saillant
- Sumi Akter, Ph.D. under Dr. Eric Saillant
- Brynna Buckmaster, M.S. under Dr. Eric Saillant

Outreach and Service Activities

There were several outreach activities in 2023. On-site activities included several TCMAC tours and discussions with different local and national groups from academic institutions and industry.

Community Events

- Pathways to Possibilities
- Peter Anderson Festival
- RESTORE Summit
- Gulf Shellfish Farmers Association Raising Shell event
- USM's Discover Gulf Park

On-site Events

- Visits from Leadership Jackson County
- Mississippi Power Economic Development
- Groups of college and high school counselors
- CTE classes from multiple high schools and STEM educators from around the state

TCMAC was also visited by several industry members seeking collaborations and technology transfer. The TCMAC continues to support the local and national aquaculture industry by partnering with businesses to help address industry bottlenecks and answer research questions. TCMAC had more than 15 business engagements for research collaborations, services, and training.



Gulf Coast Research Laboratory



DR. KELLY DARNELL
Director

The Gulf Coast Research Laboratory (GCRL) is a research and teaching unit of The University of Southern Mississippi dedicated to the advancement of scientific discovery and promotion of academic growth in the fields of marine biology and coastal sciences. The GCRL was established by the Mississippi Legislature in 1948 as the state's designated marine laboratory and was incorporated into The University of Southern Mississippi four decades later.

USM Fellow Collaborates with MBACE

Gulf Coast native Dr. Erin Oliver has been honing her professional development skills as a “match” with the Mississippi Based RESTORE Act Center of Excellence (MBACE) through the National Academies of Science Gulf Research Program Sciences Policy Fellowship.

This prestigious award gives fellows the chance to emerge with science policy in the Gulf and gain skills for pursuing a career in the sciences.

“MBACE has been a great opportunity for me to build and improve upon my science communication, program management, and stakeholder engagement skills,” said Oliver. “I have also had the opportunity to meet a diversity of people working in the Gulf region who share my interest in building sustainability and resiliency in coastal communities.”

GCRL Offers Hands-On Summer Internships to Diverse Students in Marine Science Exploration

Although there are many internships that USM offers along the coast, three focus on partnering with Historically Black Colleges and Universities (HBCU) across the region.

The National Oceanic and Atmospheric Administration Ocean Exploration Cooperative Institute (NOAA OECI) is a program striving to build inclusive pathways to institutions, science, research, and exploration while collaborating with HBCU institutions. The OECI internship, allows students to participate in a 10-week all-expenses-paid research experience that focuses on career growth along with hands-on ocean experiences.



The Nature Conservancy

The Nature Conservancy Mississippi Office Relocates to GCRL

In July 2023, The Nature Conservancy moved its Mississippi office to GCRL. The Nature Conservancy is a non-profit conservation organization that works in all 50 states and over 70 countries worldwide. The group has been focused on coastal conservation work along the Mississippi Coast since 1965. Having The Nature Conservancy based at GCRL will facilitate stronger

collaborations between USM researchers and students and The Nature Conservancy staff.

GCRL has a long history of hosting coastal- and marine-focused organizations and agencies at its sites in Ocean Springs. The administrative office for Mississippi-Alabama Sea Grant Consortium has been based at GCRL since its establishment in

1972, and the Gulf States Marine Fisheries Commission was located at GCRL from 1977 to 1989. Other agencies with offices based at GCRL have included the National Marine Fisheries Service, the Regional Office of the Mississippi Air and Water Pollution Control Commission, and the Mississippi Marine Conservation Commission.



Gulf BlueSM

PILOT COHORT COMPLETED SUCCESSFULLY
The Gulf Blue Navigator (GBN) on May 3, 2023, successfully completed the Pilot Cohort.

Cohort – 1 Funding Secured

GBN secured funding necessary for conducting Cohort – 1 which opened for applications in November of 2023. We focused on uncrewed system technologies for this cohort and received 16 applications. One applicant was from Italy, one applicant was from Singapore and the others were from within the United States, including two from Mississippi. The awarded applicants will be announced in January of 2024. The program will be four-months beginning in February 2024 and ending in May of 2024. Demo Day is planned for June 12, 2024.



Hosting Our International Visitors

International Recognition

The GBN has aided USM’s Gulf Blue Initiative, aka Gulf Blue, in receiving international recognition. USMRF has hosted delegations this past year from Germany, Belgium, Canada, Japan, and the Mandela Washington Fellowship for Young African Leaders from countries across the continent of Africa. The Pilot Cohort itself received applications from startups in 11 countries and the U.S. Gulf Blue was also featured in a major international blue economy report released in Dubai in December 2023.

National Recognition

USMRF under the Gulf Blue brand sponsored the Startup Pavilion at the OCEANS 2023 national conference held at the Biloxi Mississippi Coliseum September 25-28, 2023. Startups included in the GBN Pilot Cohort were among the seven startups featured in the Pavilion. OCEANS is an annual event for global marine technologists, engineers, students, government officials, lawyers, and advocates. At OCEANS 2023 Gulf Coast, over 1,500 industry, government, and university thought leaders gathered for four days to highlight relevant topics and current trends while creating a community of learners and influencers who consistently advance research, practices, and policies for the marine field. It is a premier national partner event presented by The Marine Technology Society and the IEEE Oceanic Engineering Society. The GBN Program Manager participated in a panel session on the Gulf Coast Blue Economy.

Three of the GBN cohort members, BeeX, Seatrec, and SeaTrac participated in the Navy Advanced Naval Technology



Exercise (ANTX) in partnership with NOAA and held at USM’s Marine Research Center in the Port of Gulfport on the last day of OCEANS 2023.

5 of 6 COHORT MEMBERS SUCCESSFULLY ENGAGED WITH FEDERAL, STATE AND LOCAL PARTNERS, UNIVERSITIES AND INDUSTRIES.

5 of 6 COHORT MEMBERS FOUND TRACTION WITH SUPPLIERS, MANUFACTURING SUPPORT, AND /OR CUSTOMERS IN THE REGION.

Monthly Networking Events

Every month we host a Blue Tech networking series. This event has attracted industry partners from Florida over to Texas and up to North Carolina and Tennessee. This is an open networking event welcoming innovators and

practitioners alike. We feature a blue-tech innovator each month. Appetizers and beverages are served with the kind support of Chandeleur Island Brewing. These events have been very successful and provide a casual and laid-back environment for networking.



Chandeleur Island Brewing Co. is an industry partner who helped create the Gulf Blue Oyster.

Gulf and Ship Island Building: The Gulf & Ship Island Building is a collaborative workspace for blue tech innovation located in the Gulfport Blue Economy Innovation District. Entrepreneurs and startups developing solutions to global challenges come here to capitalize on existing, world-class ocean research capabilities and connect to research scientists, prototyping, fabrication, laboratories, evaluation services and are in proximity to the Port of Gulfport, rail, interstates, and the Gulfport-Biloxi International Airport.

Life in the Gulf & Ship Island Building also includes proximity to small businesses and industry and an extensive mentor network as well as local, state, and federal partners—all within steps of the Gulf of Mexico, which includes year-round shallow- and deep-water testing. If you are working in the blue economy, you will not find another location with greater access to resources or a higher quality of life.

Mother Mother Ocean, I have heard your call~



December 25, 1946 – September 1, 2023

“ When you ignite the minds of kids and show them the ocean for the first time, it’s a life-changing experience. ”

—JIMMY BUFFETT - Christening of *Miss Peetsy B*



The University of Southern Mississippi
730 East Beach Blvd., Long Beach, MS

usm.edu