Gulf Research Program Grants, Reports, and Finances 2023

NATIONAL ACADEMIES
Sciences
Engineering
Medicine

GULF RESEARCH PROGRAM

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FUNDED PROJECTS

In 2023, the GRP awarded a total of $49.6M to 34 recipients through 7 grant opportunities.

Mississippi River Delta Transition Initiative

The Gulf Research Program awarded $22 million to fund a transformative new research consortium focused on advancing understanding of the future sustainability of the lowermost Mississippi River Delta, known as the Bird's Foot Delta. Over five years, the Mississippi River Delta Transition Initiative (MissDelta), led by a partnership between Louisiana State University and Tulane University, will work to transform understanding of the delta's future through the end of the century and advance research and practical ways to combat land and ecological losses.

The Bird's Foot Delta is home to communities, a rich cultural heritage, national wildlife preserves, extensive energy infrastructure, and ecosystems that provide protection from storm surges and support fisheries and ecosystem health for much of the Gulf of Mexico. In addition, approximately $2 billion in commerce passes through the waterway each week. Degradation of the region's ecosystem is thought to be caused by a complex set of processes, including drastic reductions in wetland-building river sediments. Its longevity is further threatened by increasingly intense hurricanes, rising seas, and an escalation in maintenance costs for the navigation channel. The implications of these events, especially for water quality and food networks, remain poorly understood.

Along with LSU and Tulane University, the MissDelta consortium includes six historically Black colleges and universities — Southern University of Baton Rouge, Xavier University of New Orleans, Jackson State University, Grambling State University, Dillard University, and Alcorn State University — as well as the University of Southern Mississippi, University of Central Florida, University of Louisiana at Lafayette, Louisiana Universities Marine Consortium, Water Institute of the Gulf, and the College of William & Mary.

Safer Offshore Energy Systems

The GRP awarded $4.4 million to support five projects that aim to increase safety culture in an evolving offshore energy environment by addressing the future needs of safety management systems (SMS).

As communities adapt to a changing climate and the nation works to meet a goal of net-zero emissions by 2050, the demand for integrating cleaner energy sources into the nation's energy portfolio introduces additional complexity to the offshore energy environment. While many questions remain around the energy transition, a robust safety culture and effective SMS are essential to ensure the safety and sustainability of offshore energy production.

The funded projects are:

A Stakeholder-Driven Decision-Support Tool for Empowering Fatigue Risk Management: Towards Next-Gen Safety Management Systems

Project Director: Ranjana Mehta, University of Wisconsin-Madison
Award: $1,200,094
Project Summary:

One highly recognized but under-addressed hazard in the offshore industry is fatigue. Correspondingly, the proposed research focuses on shared individual and organizational efforts to manage fatigue (e.g., Fatigue Risk Management Systems), which can either be a part of SMS or a separate policy. This proposal adopts a stakeholder-driven approach to develop a technology-enabled decision-support tool to assess and control fatigue risks while uncovering opportunities and barriers to empowering offshore energy stakeholders to integrate the tool as part of the company's SMS/FRMS. Informed by these efforts, the team will implement the tool and provide training across three offshore platforms and evaluate the tool's effectiveness on safety outcomes (behaviors and reports of incidents/near misses), safety culture, tool utilization, and user experience through a longitudinal intervention study. The project outputs (decision-support tool source codes, training/implementation documentation, etc.) and findings obtained here will be shared with the project partners and disseminated across scientific and practitioner venues.

Empowering and Enhancing Offshore Workers' SWA, UWA, Reporting Unsafe Conditions, and Employee Participation

Project Director: Changwon Son, Texas Tech University
Award: $855,760
Project Summary:

The primary objective is to address challenges of offshore workers' implementation of stop work authority, ultimate work authority, reporting unsafe conditions, and employee participation (SURE) programs. These programs were added to the Bureau of Safety and Environmental Enforcement's Safety and Environmental Management System in 2013; however, offshore workers have faced persistent difficulties conducting these activities (e.g., stopping others' work) due to poor safety culture and lack of hazard awareness skills. To overcome the problems, this project aims to develop and implement a collection of worker-centered safety tools termed the "SURE Toolbox." Such safety tools include education and training materials, operating procedures, observation and reporting cards, end-user manuals, team safety meeting guidelines, and data analytics of the SURE activities. To advance safety culture, the SURE Toolbox will focus on fostering positive leadership, feedback sharing and seeking, and a psychological safety climate. To help offshore workers identify hazards accurately, the SURE Toolbox will incorporate situation awareness principles and techniques. Results and products of the project will be available via a publicly accessible digital repository, a mobile app, webinars, workshops, online videos, professional and academic conferences, and meetings with offshore industry organizations.

Using Safety Culture Assessment Data to Enhance Safety and Environmental Management System Effectiveness

Project Director: Kevin McSweeney, American Bureau of Shipping
Award: $724,512
Project Summary:

This project aims to better understand the close-knit relationship between an organization's safety culture and its Safety and Environmental Management System (SEMS). Asset owners and lessees conduct SEMS audits, as does the Bureau of Safety and Environmental Enforcement. These audits often identify discrepancies and opportunities for improvement, which necessitate corrective actions; however, these audits do not necessarily find "why" the SEMS requirements were not implemented or maintained. This project will investigate and develop a methodology to help integrate safety culture-related assessment activities into evaluating an organization's SEMS. The goal is to work with industry stakeholders and perform safety culture activities, perform assessments of their SEMS and previous audit results, and evaluate the proposed methodology to help strengthen the organization's SEMS (i.e., continual improvement). The project will identify where the BSEE safety factors are addressed and identify potential best practices that can be used to improve an existing SEMS.

Optimizing Risk-Based Decisions: Evolutionary Safety Management Systems

Project Director: Daniel Shantz, Tulane University
Award: $1,300,000
Project Summary:

This project seeks to develop, implement, and evaluate an innovative, foundational safety data collection and safety management system pilot program that combines increased accessibility to safety data and broad application of the Success Path Method as a core element of an evolutionary SMS, proving a systematic approach for optimizing risk-based decisions in an evolving energy safety environment in the Gulf of Mexico. Project results will be shared with operators in the SafeOCS Industry Safety Data program (representing 90% of the total production output in the Gulf).

Anticipating Challenges to Today's Offshore Safety Management Framework Caused by Gulf Energy Transition Initiatives

Project Director: Joseph Rousseau, American Bureau of Shipping
Award: $368,622
Project Summary:

The Gulf of Mexico is about to undergo massive change associated with energy transition initiatives, and these changes will present new challenges to the Offshore Safety Management Framework (SMF) for the Gulf. Offshore wind, ocean energy systems, CO_2 capture and sequestration systems, new oil and gas production and exploration technologies, the possibility of advanced nuclear technology deployments, and associated

marine construction and support activities with a wide range of new stakeholders will transform the Gulf between now and 2050 when decarbonization goals have been set. This project aims to (1) identify and assess the key changes that are coming to Gulf with energy transition, (2) examine how these changes are likely to challenge the current SMF in the Gulf, and (3) make recommendations for proactively adapting the SMF to stay ahead of emerging risks. This project will be led by the not-for-profit marine classification society for the U.S., the American Bureau of Shipping, in collaboration with key industry/academic coalitions closely associated with energy transition in the Gulf: Louisiana Wind Energy Hub, Offshore Energy Safety Institute, and Blue-Sky Maritime Coalition.

Increasing Understanding of the Effects of Climate Change on Environmental Hazards in Overburdened Communities

Adverse conditions such as extreme heat, sea-level rise, flooding, and extreme weather events are occurring more frequently and simultaneously, often interacting with non-climatic risks that threaten human health and well-being, such as heat-related stress and air and water pollution. Communities overburdened by these non-climatic risks are likely to experience more intense health impacts from climate change as adverse conditions compound, resulting in greater health disparities when compared to communities less exposed to environmental hazards. These disparities are particularly relevant to flood-prone communities in proximity to oil, gas, and petrochemical facilities such as those located along the U.S. Gulf Coast.

The Gulf Research Program awarded $5.9 million to support four projects that will advance the understanding of climate change effects on local health disparities. Collectively, these projects will create a series of models to better understand how environmental hazards influence human health outcomes and how those hazards will be affected by climate change under varying scenarios and time frames.

The funded projects are:

Mapping Local Climate Change-Attributable Health Burdens

Project Director: Christopher Uejio, Florida State University
Award: $1,500,000
Project Summary:

Climate change is adversely impacting human health and is projected to exacerbate environmental exposures from extreme heat, air pollution, and tropical cyclones/hurricanes. Overburdened communities often face higher environmental exposure levels, have preexisting health conditions that increase the risk of adverse outcomes, and have lower financial capacity to respond to and recover from exposures and disasters. The project's overarching goal is to investigate and model interactions of neighborhood-level environmental hazards. The study will infer climate-attributable health outcomes that will be synthesized into a cumulative risk map to summarize environmental health disparities by zip code. Working with regional planning councils, a social survey will prioritize future time periods and health disparities and streamline the translation and communication of the project's outputs (e.g., data formats, story maps). The project will build local government capacity to understand the strengths and limitations of environmental exposures and climate projections, and provide insight into health disparities.

Climate-LEAD: Climate Effects on Localized Environmental Health Disparities in Overburdened Texas Communities Along Gulf Coast

Project Director: Lei Zou, Texas A&M University
Award: $1,499,990
Project Summary:

This project will develop fine-scaled databases, models, and tools to predict near-, mid-, and long-term impacts of climate change-intensified air pollution and water insecurity on health disparities in overburdened Texas communities along the Gulf Coast. Southeast Texas communities have long borne the brunt of poor localized air and water quality, partially due to emissions from petrochemical facilities and frequent coastal hazards. Ongoing climate change will cause more extreme events, exacerbating environmental hazards and health crises in these already overburdened communities. This necessitates an urgent effort to quantify future environmental health disparities under climate change in these communities to inform mitigation strategies. The databases, models, webGIS, and strategies produced through this project will guide stakeholders to strengthen health resilience to environmental hazards under climate change.

Using Climate Scenarios to Inform Public Health Planning in Overburdened Communities in Florida and Mississippi

Project Director: Andrew Rumbach, Urban Institute
Award: $1,482,900
Project Summary:

Climate hazards like heat waves and hurricanes are associated with negative public health outcomes, but local governments, health care providers, and emergency managers in overburdened communities often have inadequate tools to proactively plan for them, especially with the uncertainties of climate change. This project will develop a unique framework, at the intersection of climate and health, that will allow overburdened communities in Florida and Mississippi to develop robust public health strategies aimed at reducing negative health outcomes due to climate hazards and addressing treatment capacity at emergency rooms and hospitals. This project will model the empirical relationships between health and extreme events by combining datasets on hospital admissions, emergency room visits, and extreme climate events in the two states and collect qualitative data in four case study communities. The project will create an online, customizable data visualization and scenario planning tool that draws on these climate and health models. We will then collaborate with key stakeholders in the four case study communities to host scenario planning workshops that envision climate health adaptation pathways. A scenario planning guide will allow other overburdened communities to replicate these analyses and workshops.

Assessing the Public Health Risk Due to Tropical Cyclone Impacts on Petrochemical Facilities

Project Director: Boniface Fosu, Mississippi State University
Award: $1,492,014
Project Summary:

Natural disasters have long overburdened communities along the U.S. Gulf Coast. Among them, tropical cyclones (TCs) are the most consequential. Direct hazards from TCs include high winds, heavy rains, and storm surges, but TCs can also beget other equally destructive hazards. The latter include petrochemical spills from aboveground storage tanks (ASTs), which are critical infrastructure to the Gulf region's oil and gas industry. The communities that are most affected by TCs and petrochemical spills remain among the poorest nationwide and, to this day, lack the capacity to deal with the plethora of health, environmental, and socioeconomic consequences that have traditionally followed in their wake. Climate change is expected to exacerbate existing TC hazards, thus raising the specter of more intense storms, leading to more frequent severe spills. What remains unknown is the potential extent of these spills and their human health outcomes. We propose a modeling framework that will allow us to discern the spill dynamics for ASTs and their human health implications in response to TC hazards, both in the current climate and under plausible scenarios of future carbon emissions.

Empowering K-8 Youth Through Place-Based Education

The Gulf Research Program announced awarded $2 million to support eight projects that engage children and youth in place-based educational activities to foster the development of scientific and environmental skills that are critical to solving complex issues in the Gulf region now and into the future.

These projects will help connect young learners across the Gulf of Mexico region with local environmental issues through such diverse activities as exploring wastewater issues in rural Alabama, training Florida teachers to incorporate place-based learning into their lessons, involving Texas students in citizen science projects to monitor the environment, providing rural Mississippi students with experiential education, and connecting urban Louisiana students with their local watersheds and wetlands. All eight proposals seek to help students develop a deeper connection to place, improve their scientific and environmental literacy, and work toward the betterment of the region at large.

The funded projects are:

Experiential Place-Based Environmental Literacy in the Mississippi Delta

Project Director: Amanda Delperdang, Mississippi Delta Nature and Learning Center
Award: $236,772.40
Project Summary:

Children ages 5-15 in the Mississippi Delta will be provided with hands-on educational experiences that teach them about environmental stewardship in their community. The purpose of the program is to connect children and youth to nature rather than teaching them abstract concepts in a standard classroom setting. With the increased use of technology in classrooms, students in the Mississippi Delta spend less time engaging with

the natural world, sometimes even regularly skipping recess due to testing concerns and cutting science instruction short to focus on tested subjects. This program will provide children with experiential science learning opportunities through field trips, summer camps, and weekly programming. The program will take place at the Mississippi Delta Nature and Learning Center, a 30-acre piece of land with an outdoor children's garden, trails, and wildflower meadows. Activities in the program are hands-on and student-led designed around the Mississippi College and Career Readiness Standards.

OCEANS (Oceanography, Conservation, Ecology, Arts, Nature, and Stewardship): Building Resilience Through Place-Based Learning

Project Director: Katie Doyle, Flour Bluff Independent School District
Award: $472,679
Project Summary:

OCEANS (Oceanography, Conservation, Ecology, Arts, Nature, and Stewardship): Building Resilience Through Place-Based Learning will be implemented in K-8 grades of Flour Bluff Independent School District, which is comprised primarily of minority students from economically disadvantaged homes who are at high risk of dropping out of the educational system. OCEANS will educate, inspire, and empower students, teachers, and community stakeholders to protect their environment. This will be achieved by 1) enriching learning with place-based citizen science/stewardship projects that build capacity with cross-generational knowledge from community partners; 2) integrating place-based OCEANS-themed curriculum in K-8 classrooms; 3) empowering older students to be environmental ambassadors to younger students through place-based, hands-on activities; and 4) drafting an Environmental Stewardship and Literacy Plan for the community that supports resiliency. OCEANS will complement formal state-wide education learning objectives and increase STEM literacy specific to our underrepresented community by developing a sense of community ownership and awareness of unique coastal resources.

Rural Water Education Partnership for Place-Based STEM Learning in Out-of-School Programs

Project Director: Christopher Spencer, Black Belt Community Foundation
Award: $287,832
Project Summary:

The Rural Water Education Partnership is composed of the Black Belt Community Foundation, University of Alabama, and Hale County School System with the shared goal to promote STEM literacy and workforce readiness for students in grades 6-8 through hands-on, engaging STEM learning, student-initiated research projects, and advocacy opportunities based on cutting-edge water and wastewater research already occurring in students' communities. It will also promote STEM skills and career awareness for the participant teachers and provide opportunities for STEM researchers to build their skills and capacity for educational outreach and public communication of science.

Suwannee Watershed: Assessment and Monitoring of Place to Gain Understanding of Local Flow (SWAMP to GULF)

Project Director: Lacey Huffling, Georgia Southern University
Award: $465,335
Project Summary:

The purpose of SWAMP to GULF is to develop a Florida place-based professional development opportunity for middle school science teachers that builds on the Okefenokee Swamp place-based professional development opportunity, Our2Swamp. Florida teachers will be trained to monitor local watershed conditions and examine the health and resilience of local ecosystems along the Gulf through research service learning. Teachers will integrate place-based citizen science projects, such as Adopt-a-Stream, and create inquiry and design thinking lessons to increase students' understanding of human and climate impacts on local watersheds on the Gulf of Mexico.

A Watershed Event (AWE): Empowering K-8 Youth through Place-Based Education

Project Director: Donna Ellen Granger, Florida State University
Award: $117,443
Project Summary:

The project will be centered around the Apalachee Bay in the Gulf of Mexico and its watershed. Field investigations for students and their teachers will be held at the FSU Coastal and Marine Laboratory at Turkey Point in Franklin County. Thus, the target audience is students from a five-county region that borders this watershed, and by extension their teachers and parents. The goal of the project is to build understanding of environmental issues in and promote stewardship of the Gulf and its watershed among students through meaningful science educational experiences. To maximize students' formal education experience, teachers must become facilitators of learning in which students themselves develop the science concepts with teachers as guides scaffolding the learning by carefully sequencing learning experiences and investigations, asking questions to engage students in sense making, and building on student ideas. To aid in the shift to this type of instruction, professional development for teachers will also be provided.

Watersheds, Wetlands, and Urban Ecology: New Orleans East Youth Envision the Future for Their Community

Project Director: Diane Maygarden, University of New Orleans
Award: $242,596
Project Summary:

This interdisciplinary project will engage approximately 800 secondary school students in grades 5 through 7, their teachers, and community members in East New Orleans in place-based education focused on exploring their connections to the wetlands and watershed surrounding their neighborhood and school and the role these surrounding wetlands play in ecological and community health. Project collaborators will engage students in inquiry and project-based multidisciplinary educational programming in their school, community, and at Bayou Sauvage Urban National Wildlife Refuge and other green spaces. Classroom and outdoor

science inquiry learning activities geared to Louisiana state curriculum standards will enable program participants to gain skills and knowledge in the application of hands-on science. Students and teachers will explore the interconnectivity between their community and the surrounding environment through visits to a variety of local sites to learn how human communities are intricately linked to natural communities and ecosystems.

Wetland Days: Watershed-Based Enrichment Opportunities for Youth

Project Director: Dani DiIullo, Louisiana Sea Grant
Award: $88,800
Project Summary:

Wetland Days are single-day, place-based field experiences that are customized to both the local habitat of the participating public schools and the needs of the K-8 teachers and administrators from the school system. Through immersive place-based activities and investigations, Louisiana Sea Grant seeks to build environmental literacy using applied learning that supports classroom instruction. Wetland Days are customizable opportunities that allow schools to build a placed-based field investigation (from a menu of choices) that will be age-appropriate, standards-aligned, and contain sound science. Sea Grant will take on the financial, instructional, and logistical challenges that are inherent to off-campus learning. This will allow the teachers to focus on classroom instruction, with the knowledge that Wetland Days will serve as a tool to apply that information in a local setting. This project seeks to enhance the environmental literacy of over 1,000 Louisiana public school students through the co-creation of place-based educational opportunities.

Youth Wetlands Education Project

Project Director: Rashida Ferdinand, Sankofa Community Development Corp.
Award: $150,000
Project Summary:

The Sankofa Community Development Corp. Youth Wetlands Education Project, located in the vulnerable Lower Ninth Ward community of New Orleans, creates a framework for ecology education, nature-to-classroom connections, and equitable access to nature that will ignite K-8 students' knowledge of our environmental challenges in Southern Louisiana, and will provide educators with key professional development opportunities. Utilizing Sankofa's Wetland Park and Nature Trail — our 40-acre green infrastructure and wetland restoration initiative — the project will: 1) develop and expand a variety of environmental education field studies aligned with the state content school standards; 2) offer structured experiences that integrate ecology, natural history, health and wellness, art, and local history, giving students important time not only to explore nature but also to build on key concepts as they advance through grades; 3) host educators from New Orleans Public Schools and provide them with environmental lesson plans and professional development opportunities; and 4) engage ecologists, naturalists, and scientists from Louisiana and around the country who utilize the Wetland Park as space for research and coastal restoration studies.

Engaging Communities to Design Nature-Based Solutions to Mitigate Climate-Related Hazards

The Gulf Research Program awarded $3.7 million to support four projects that engage communities to design nature-based solutions to mitigate climate-related hazards. This is the second and final phase of a grant which focuses on the importance of nature-based solutions as resilient infrastructure to lessen the impacts of a changing climate. This second phase supports projects by teams from the initial planning phase that address climate-related hazards, such as flooding or heatwaves.

The funded projects are:

Community Ownership Model for the Design of Nature-Based Solutions Along the North Claiborne Corridor

Project Director: Angela Chalk, Healthy Community Services
Award: $1,000,000
Project Summary:

This project convenes community-based organizations and a network of engaged residents in at-risk communities, partners across local government agencies, and technical experts in the fields of engineering, landscape architecture, and valuation. Its purpose is to develop a replicable, scalable, community ownership model of envisioning, designing and implementing nature-based solutions (NBS) along the North Claiborne Avenue Corridor. This area includes under-resourced communities connected along the corridor and is an economic, social, historical, and cultural thoroughfare. It is also a major hurricane evacuation route for Orleans, St. Bernard and Plaquemines parishes. Rainstorm events often lead to flooding for communities along this corridor and negatively impact the quality of life for its community members. This collective of four community organizations has established a connection with a network of engaged residents educated about NBS who are experts in identifying the effects of climate hazards in their neighborhoods. By collaborating with community organizations in the Water Wise Collective, these residents have envisioned 120 NBS priority projects that seek to alleviate flooding, reduce urban heat island effect, and beautify their communities. By securing technical experts, they will determine which priority projects will be the most impactful by using hydrologic and hydraulic models, scaling up as necessary, and prepare those projects to be shovel-ready by generating designs and construction documents. Additionally, because many of these identified priority projects are located on government-owned land, they will continue to build bridges and partnerships with government stakeholders and agencies to secure funding for the implementation of the NBS priority projects.

A Living Shoreline Design Approach Supporting the Pointe-au-Chien Indian Tribe's Climate Adaptation Efforts

Project Director: Matthew Bethel, Louisiana Sea Grant
Award: $780,308
Project Summary:

The traditional lands of the Pointe-au-Chien Indian Tribe ("PACIT" or "Tribe"), in Terrebonne and Lafourche Parishes in southeastern Louisiana, include diverse ecological and cultural resources, such as birds, plants,

animals, fish, cemeteries, and sacred sites. Historically, Tribe members were fishers, hunters, and farmers. While many Tribal members continue to fish as a livelihood, climate-related hazards threaten their continued existence in the region and ability to thrive. Adaptation measures taken by Tribal members have not been sufficient to withstand increased tropical storm impacts because of the loss of much of their traditional lands to open water, exposing the community to greater storm surge and more frequent flooding. Following Hurricane Ida's devastating impacts in August 2021, the Tribe is developing a comprehensive community-based strategy to prepare for future storms called the Pointe-au-Chien "Resilient Rebuilding Plan." Living shorelines are an NBS that can support the PACIT in achieving critical aspects of its vision to sustainably rebuild and adapt to increasingly severe climate-related hazards. A deliberate and coordinated approach is necessary to siting such projects so the sum creates enhanced benefit beyond what individual projects may provide. This project presents an opportunity to design a network of coordinated living shoreline structures or "Living Shorelines Network." This concept is a key strategy for protecting the community from future storm impacts and flooding that honors the Tribe's cultural heritage and priorities. They expect this process will inform the design of similar measures in other coastal communities most at risk.

Community-Based Design Using Nature-Based Solutions to Meet Climate Change Challenges Along Urban Hillsborough River, Tampa

Project Director: Ping Wang, University of South Florida
Award: $990,008
Project Summary:

Three sites along the urbanized Hillsborough River in Tampa, Florida are selected for the design of NBS to meet pressing climate-change challenges. All three sites are popular Tampa city parks serving large at-risk and under-resourced communities. A multi-disciplinary team composed of University of South Florida researchers, City of Tampa staff, and consultants is assembled to design the NBS. The three sites are exposed to different climate-related hazards. Site 1 is low-lying and highly vulnerable to submergence by sea-level rise and storm surge, along with shoreline erosion by wind- and boat-generated waves. Site 2 is suffering from aggressive riverbank erosion due to strong flow, along with large un-treated stormwater discharge. Site 3 is directly downdrift of the river dam with deteriorating stormwater structure, in addition to riverbank erosion and flooding related to water release at the dam. Three corresponding general NBS approaches including artificial reef plus wetlands for Site 1, constructed wetlands plus pond/stream and shoreline stabilization for Site 2, and stream daylighting and wetlands for Site 3 will be introduced to the community. They will conduct lived experience engagement with the communities through opinion survey, focused group discussion, and workshops with discussion. The goal of this project is to design the NBS based on the above three concepts through constructive and iterative community engagement. The final NBS design will embody community acceptance and ownership. In addition, the consultants will ensure that the NBS design has adequate technical drawings and accurate cost estimate to seek implementation funding.

Cedar Key ShOREs (Shoreline Options for Resilience and Equity)

Project Director: Savanna Barry, University of Florida
Award: $988,944
Project Summary:

This project will leverage previous community engagement to design NBS around key public infrastructure. Recent collaborations on living shorelines between Cedar Key stakeholders and University of Florida generated interest in further application of NBS for vulnerable public infrastructure threatened by sea level rise, frequent storms, and chronic erosion. Cedar Key is particularly vulnerable to storm surges and rising seas, and recent hurricanes have caused extensive damage to shorelines and the community. Of particular concern is the highly exposed G and 1st Street neighborhood and low-lying adjacent neighborhoods. This focus area encompasses critical routes for emergency services, a popular shore fishing spot, and a public school in addition to private homes, local businesses, and failing stormwater infrastructure. Multiple groups interact with the focus area and must be continually engaged to ensure an equitable solution is achieved. This project will build on Phase I outcomes to assist Cedar Key with the highly technical project design, advancing concepts toward permitting while incorporating input from the community. In Phase I, they deployed stakeholder-driven workshops and survey processes, conducted site visits to inform design possibilities, and integrated technical expertise with local preferences, equity considerations, and infrastructure needs.

Workforce Development for the Energy Transition

The existing energy infrastructure and knowledge base in the Gulf region is advantageously positioned to integrate clean energy technologies as part of the nation's commitment to achieve net-zero greenhouse gas emissions by 2050. In addition to leveraging existing infrastructure, a skilled technical workforce will be essential to strengthening the diverse energy environment of the future.

The Gulf Research Program awarded $1.1 million to fund four projects that will support young people ages 16-25 in acquiring the skills, knowledge, and credentials necessary to enter careers in the future energy workforce.

The funded projects are:

Student Scholarships for Center of Vocational Excellence (CoVE) for Offshore Renewables

Project Director: Jerry V. Graves Sr., Nunez Community College
Award: $321,772
Project Summary:

Nunez Community College — a traditionally minority serving institution — delivers relevant and innovative curriculum leading to academic credentials and workforce opportunities. Nunez offers a Global Wind Organization-certified associate of applied science-wind energy technology program, which prepares students for immediate employment as a wind turbine technician or for transfer to an institution of higher learning. Students within this program also earn a career and technical certificate in offshore safety and survival, and a technical diploma in wind Turbine mechanics and maintenance. The wind energy sector will offer new career opportunities within traditionally underserved communities. This project will support the first cohort of 20 students in the wind energy program with full scholarships, providing long-standing and tangible change for not only the community but also the country.

Empowering Tomorrow's Workforce: Scholarships for Line Worker Program

Project Director: Danna Spires, Northwest Louisiana Technical Community College
Award: $160,000
Project Summary:

Northwest Louisiana Technical Community College (NLTCC) is beginning a scholarship program for its 32-week power line worker program, aiming to create an accessible pathway for talented individuals to enter the energy sector. The grant will provide merit-based and needs-based scholarships covering tuition, books, and equipment to overcome financial barriers for aspiring students. NLTCC seeks to develop a skilled workforce of power line workers dedicated to the sustainable growth of the energy industry while advancing technical knowledge and skills that directly relate to regionally identified job needs and careers in the energy workforce. One of the core objectives of this scholarship program is to empower students to attain stackable industry credentials bolstering their employability within the energy sector. These credentials will validate the students' expertise and increase access to job opportunities in the energy sector. The collaborative partnership between NLTCC and Southwest Electric Power Company will also ensure students have access to invaluable hands-on experience and mentorship from seasoned professionals in the energy sector. Their industry guidance will also ensure the training remains relevant to current industry trends and best practices, producing graduates who are not only job-ready but also well-equipped to thrive in a dynamic energy landscape.

TRACE: Texas Research Alliance for Clean Energy

Project Director: James 'Chris' Thomas, Texas A&M University
Award: $471,874
Project Summary:

TRACE: Texas Research Alliance for Clean Energy is a pilot academia/industry collaborative effort aimed at developing undergraduate engineering students in Texas specifically for the clean energy workforce. The pilot program includes five Texas-based universities, eight faculty members, seven Texas-based companies, eight industry partners, and eight undergraduate engineering students. Academic and industry partners have been strategically selected based on their expertise and ongoing work on clean energy technologies, including hydrogen and ammonia production, storage, transportation, combustion, and utilization; wave/wind energy harvesting; and carbon capture technologies. Undergraduate students will conduct research under their faculty mentor's guidance at their host institution during the spring and fall semesters. The students complete a summer internship between the semesters with their host industry partner on a clean energy topic related to their research. The student participants are also required to attend seminars on clean energy topics, complete an industry-recognized credentialing program, and conduct STEM outreach activities. The main goal of this effort is to develop a sustainable, scalable, and collaborative multi-entity program that facilitates the development and training of undergraduate engineering students in the Gulf region. This program will enable student participants to successfully obtain careers in the regional clean energy workforce. In addition, the program will foster collaboration between participants and address lacking workforce skills and needs.

Solar and Electrical Concepts Apprenticeship

Project Director: Calvin Avant, Unity In The Family Ministry Inc.

Award: $149,470
Project Summary:

The Solar and Electrical Concept Apprenticeship workforce development program will target marginalized and underserved populations who are either unemployed or underemployed. The goal is to provide 25 16- to 25-year-old individuals with the skills that will prepare them to pursue a career as an electrician helper and/or a solar installer helper and support the energy transition from fossil fuel to solar energy. The program consists of a 12-week, 320-hour training program.

Improving Public Health Data Systems to Address Health Equity Challenges for At-Risk Communities in the U.S. Gulf Coast

In partnership with the Robert Wood Johnson Foundation, the Gulf Research Program announced awards totaling almost $7.5 million to support community-engaged research on the role that data on the social determinants of health could play in improving public health data systems to better address health disparities. These awards aim to support historically Black colleges and universities (HBCUs) and other minority serving institutions (MSIs) located in the five Gulf states: Alabama, Florida, Louisiana, Mississippi, and Texas. Funds for the awards were provided by the Robert Wood Johnson Foundation.

The five awarded projects develop academic-community partnerships that use community-based participatory research to demonstrate how data on climate-specific, environmental, and social determinants of health could better inform health policies and services to promote health equity for at-risk communities that are disproportionately experiencing the impacts of climate change.

The funded projects are:

A Right to Be Counted: Enhancing Syndromic Surveillance Capabilities for Vulnerable Gulf Communities

Project Director: William Sage, Texas A&M University
Award: $1,494,462
Project Summary:

The National Syndromic Surveillance Program (NSSP) incorporates a national infrastructure of diverse datasets — including emergency room, laboratory, and environmental data. Existing policies prioritize individual over community interests, often suppressing data on small, at-risk communities. Policies supporting communities' "right to be counted" are critical to identify and address health inequities. This proposal will enhance NSSP policies to better account for social determinants of health, health disparities, and environmental and climate-exacerbated health outcomes while supporting and empowering vulnerable Gulf communities by collaborating with federal partners to identify opportunities for enhancing NSSP, through enhancing existing data streams, linking data, and incorporating new data sources ethically and equitably; exploring community needs and concerns using community-based participatory research (CBPR) with two at-risk populations and ultimately develop policies to support enhanced data collection; and developing NSSP policy opportunities and strategies to support vulnerable communities as part of the ongoing Data Modernization Initiative (DMI), incorporating CBPR findings and preparing a report for federal policymakers.

Health Equity and Public Health Data Systems in Nueces County, Texas, At-Risk Neighborhoods

Project Director: James Gibeaut, Texas A&M University-Corpus Christi
Award: $1,499,471
Project Summary:

This project will provide decision-makers and local communities with useful and integrated public health system and comprehensive data related to social determinants of health (SDoH), environmental factors, and climate risk to engage in equitable urban planning and decision-making for at-risk coastal communities of color in South Texas. The project will ensure interventions and policies that address health disparities are responsive to the unique needs and challenges faced by at-risk communities in Nueces County, Texas, including by better informing public policy and community leaders with the data they need to drive evidence-based approaches. The interdisciplinary approach uses mixed-methods and community-based participatory research to co-develop a social well-being and equity logic model linking health disparities to SDoH, climate, and environmental factors; validate linkages through structural equation modeling; and contextualize findings with deep engagement and thematic and content analysis.

The project will result in three products, including a data integration framework that public health organizations and hospitals can use to better integrate data on SDoH in health data systems, a comprehensive action strategy to advance progress on identified SDoH in need of action, and a geospatial Health Equity Tool that broader decision-makers can use to integrate SDoHs, climate, environment, and health into emerging policies, plans, and agendas.

Community-Driven Geospatial Approach to Improving Public Health Data Systems in Beaumont-Port Arthur, Texas

Project Director: Ayodeji Iyanda, Prairie View A&M University
Award: $1,488,160
Project Summary:

This project aims to identify important SDoH using community-based participatory research. The project will examine the impact of industrial pollution from petrochemical plants on the high cancer and asthma rates of the region. Community-driven research activities including data collection training on air monitoring and health needs assessment to identify SDoH affecting the health, health care needs, and access to preventive care of these at-risk communities. The project will employ a mixed-methodological approach that combines quantitative and qualitative data to inform socio-environmental policies addressing health disparities.

The project's interdisciplinary approach has the potential to develop innovative strategies for addressing the health disparities associated with climate change and environmental degradation that will result in enhanced health equity for vulnerable populations and the strengthening of existing public health data systems. Project outcomes will inform policy decisions and the design of interventions to mitigate and reduce environmental health burdens and risks, such as asthma and cancer, and contribute to global efforts to address environmental injustices as a structural public health issue.

Multisectoral Partnerships to Address Successive Disaster Events, Affordable Housing, and Mental Health

Project Director: Omolola Adepoju, University of Houston
Award: $1,499,058
Project Summary:

This proposal seeks to develop formal academic-community partnerships to build a geospatial-photoethnography dashboard, co-owned and co-developed by the community, to chronicle and assess the impact of successive disaster events on affordable housing and mental health outcomes in three historically medically underserved communities in Houston, Texas: Greater Third Ward, Greater Fifth Ward, and Kashmere Gardens. Earlier work in this space has been siloed, and while community partners are sometimes involved, most research partnerships are not structured to allow communities to co-own these projects from inception to project end. Given the increasing frequency of natural disasters precipitated by climate change, the importance of bottom-up, community-driven efforts — led by residents of communities affected by these disasters — is paramount to better understand and address the impacts of climate change on environmental health disparities.

Using community-based participatory research principles, the project proposes to 1) build digital geospatial-longitudinal maps to display historic to present-day housing insecurity and mental illnesses in target communities between 1980-2022 at the census tract level, with projected layers for 2030, 2040, and 2050, and utilize the developed maps to co-produce with communities toward three sub-aims; 2) employ photoethnography concepts to assess the impact of successive disasters on the three local communities, including the use of community conversations and photovoice to collate a storyboard of people's experiences; and 3) engage the community in developing a geospatial-photoethnography dashboard as a public health data system that is user-friendly and accessible to community members while building community mental health capacity.

Project Step: Utilizing CBPR to Examine Social Determinates of Health Targeting Environmental Data with Underserved Populations

Project Director: Dawn Bishop McLin, Jackson State University
Award: $1,500,000
Project Summary:

The project will employ a mixed-methods strategy utilizing an interdisciplinary, culturally competent community-based participatory research (CBPR) approach to engage affected communities in identifying existing data, data gaps, and assets that can be leveraged to address pernicious health problems for Gulf Coast communities through improved public health data systems. The project will convene and train constituents of and with our CBPR partners, conduct analyses of secondary data to present the SDoH, climate change and environmental factors, and asthma/respiratory illnesses rates, and where data exists for Black and Vietnamese people in the Gulf Coast region. The project will also conduct a community systems analysis that includes a one-time online survey and key informant interviews with community representatives (e.g., health departments, social service agencies, housing authorities, etc.) as well as convene groups for discussions of data and gaps. Our aim is to gather nontraditional perspectives on SDoH data, needs, and

assets to address issues disproportionately affecting Black and Vietnamese people in their communities, and needs for data to better inform health agendas, planning, services, programs, and resource allocations. Community residents will be trained to provide photos that depict problems in their communities for which they need better data to document and use in planning, service delivery, and resource allocations.

In addition to these awards, the GRP awarded almost $3 million to a second phase of the Cycle 1 awards of the Improving Public Health Data Systems to Address Health Equity Challenges for At-Risk Communities in the US Gulf Coast grant in partnership with the Robert Wood Johnson Foundation.

HBCU-CBO Gulf Coast Equity Consortium Initiative to Address Social and Environmental Determinants of Health Challenges

Project Director: Robert Bullard, Texas Southern University
Award: $1,500,000
Project Summary:

This project brings together CBOs in the five Gulf Coast states of Alabama, Florida, Louisiana, Mississippi, and Texas who experience significant vulnerability to flood events, including hurricanes supercharged by climate change, as well as racially disproportionate pollution burdens in the form of legacy pollution and contaminated sites where toxins migrate in stormwater, hazardous industrial operations that contribute to natech disasters, transportation plans and projects that exacerbate flood impacts, and the destruction of wetlands that absorb and store rainfall. This project focuses on conveying these experiences through the generation of community-level data to inform policy development for equitable outcomes.

Bridging the Gap between Climate Change and Determinants of Health in South Louisiana

Project Director: Faye Grimsley, Xavier University of Louisiana
Award: $1,495,261
Project Summary:

Bridging the Gap between Climate Change and Social Determinants of Health (SDOH) in South Louisiana is Xavier University of Louisiana's community partnership project to improve public health data and advance equitable decision-making around health disparities in at-risk Black, Indigenous, and other People of Color coastal communities in southeast Louisiana. The project's target community is the Lower Ninth Ward in New Orleans (Orleans Parish) and its southern neighbor, the town of Phoenix, in Plaquemines Parish, which spans the last 70 miles of the Mississippi River to the Gulf of Mexico. Like other Mississippi River Delta and coastal communities, the target community is impacted by profound environmental justice and climate-change challenges, including environmental contamination and pollutants, wetlands erosion/land loss, heatwaves, and greater frequency and intensity of tropical storms and flooding. The Lower Ninth Ward and Phoenix also share a history of disenfranchisement and material disadvantage, enforced through structural racism, geographic isolation, and government neglect. Ultimately, climate change and social hazards work together to amplify the risk for poor health in a setting without adequate resources to protect against these threats. The

current partnership project will address these concerns through analysis of existing data system gaps as well as an equity driven community-based participatory research approach and the creation of a coalition of community and other stakeholders to influence policy. At the project's end, we will release final recommendations for SDoH and climate change determinants to improve the breadth of available data and to better capture the needs of Black, Indigenous, and other People of Color coastal communities in southeast Louisiana.

The Gulf Scholars Program

In 2023, we welcomed five new schools to the Gulf Scholars Program (Auburn University, Mississippi State University, Prairie View A&M University, Texas A&M University, and the University of Florida), raising the number of participating institutions to 18. With targeted funding, attention, and support, this undergraduate program is helping Gulf-based institutions of higher education cultivate future leaders who will serve the region as scientists, engineers, educators, community leaders, policymakers, designers, and innovators in local communities.

PUBLICATIONS

Advancing Health and Resilience in the Gulf of Mexico Region: A Roadmap for Progress

Consequences of natural disasters and the COVID-19 pandemic have taken a cumulative toll on the health and well-being of people in the Gulf of Mexico region. Long-standing societal challenges related to racism, poverty, education, housing, and underemployment are compounding the trauma, leading to chronic stress for many Gulf residents. The Committee on Progress Toward Human Health and Community Resilience in the Gulf of Mexico Region new report, Advancing Health and Community Resilience in the Gulf of Mexico Region: A Roadmap for Progress, explores key challenges and priorities in Gulf states, including Alabama, Florida, Louisiana, Mississippi, and Texas and evaluates recent progress. The report also makes recommendations for closing critical gaps and implementing transformative approaches that focus on the diverse needs and experiences of people who live and work in the Gulf region.

Navigating the Energy Transition in the Gulf of Mexico: Proceedings of a Workshop

Today, with a changing climate putting pressure on communities and ecosystems worldwide, goals for a carbon-neutral economy mean that renewable and low-carbon energy sources are being presented as solutions. While these cleaner energy sources have the potential to reduce risk to the environment and bring energy security closer to a reality, questions remain about the stability of the energy supply chain, the ability to meet energy demand reliably, and the best ways to produce fair and equitable outcomes in an energy transition.

To serve as a catalyst for developing new insights and coordination around the energy transition, the Gulf Research Program at the National Academies of Sciences, Engineering, and Medicine convened a 2-day workshop in Washington, DC, called Navigating the Energy Transition in the Gulf of Mexico. Based around

two scenarios in the year 2050 - one in which a carbon neutral economy is achieved and another in which robust dependence on fossil fuels remains - this serious gaming event stimulated the sharing of ideas, concerns, and cascading impacts from participants across academia, industry, government, and Gulf communities. This publication summarizes the activities, presentations, and discussion of the workshop.

Advancing Understanding of Offshore Oil and Gas Systemic Risk in the U.S. Gulf of Mexico: Current State and Safety Reforms Since the Macondo Well-Deepwater Horizon Blowout

Most of the offshore oil and gas industry in the Gulf of Mexico has shown considerable improvement in systemic risk management, which is now approaching a middle stage of maturity across most risk elements. Advancing Understanding of Offshore Oil and Gas Systemic Risk in the U.S. Gulf of Mexico: Current State and Safety Reforms Since the Macondo Well–Deepwater Horizon Blowout assesses both industry and regulatory progress against the reforms that were recommended following the Deepwater Horizon disaster in 2010. The report also states that progress has been uneven, and critical gaps remain in comprehensively addressing the management of systemic risk offshore.

FINANCIAL SUMMARY

Financial Overview	
Proceeds Received	$500,000,000
Investment Return in FY2023	$60,116,530
Investment Return in previous years	$139,732,002
Total Funding:	$699,848,532
Expenses in FY2023	($44,634,656)
Expenses in previous years	($182,624,778)
Total Expenses:	($227,259,435)
Balance as of 12/31/2023:	$472,589,097

Proceeds Received by the National Academy of Sciences

		BP Exploration and Production Inc.	Transocean Deepwater Inc.	Total
Proceeds received:	2013:	$5,000,000	$2,000,000	$7,000,000
	2014:	$15,000,000	$7,000,000	$22,000,000
	2015:	$45,000,000	$21,000,000	$66,000,000
	2016:	$80,000,000	$60,000,000	$140,000,000
	2017:	$90,000,000	$60,000,000	$150,000,000
	2018:	$115,000,000	$0	$115,000,000
Total proceeds:		**$350,000,000**	**$150,000,000**	**$500,000,000**