Sessions

Gulf Conference 2026

Resilience of Natural and Human Communities

Resilience is the capacity of a person or community, including the socioeconomic and natural systems, to adapt positively when faced with extreme events and adversity (e.g., sea level rise, extreme events, human impacts), and cope with abnormal or unexpected threats without changing beyond recognition.

The purpose of this session is to establish dialog and facilitate coordination and collaboration to identify individual, community, and/or coastal resilience needs and gaps. Presentations will focus on the interconnected network of systems that directly affect humans and/or society, including the socioeconomic, ecological, and built environments.

Shoreside livelihoods at the crossroads: Coastal change, contaminants, and community well-being

Coastal fishing populations maintain deep social, cultural, and economic connections to the pulse of the water. These communities are rooted in their interactions with their coastal environments—harvesting resources, sustaining families and livelihoods, and maintaining cultural traditions that have evolved over generations. However, climate change and environmental contaminants can alter these interactions in ways that impact human health and overall well-being. Warming oceans are responsible for species distributional changes and increased intensity and frequency of extreme weather events, which impact where, when, and how fishing occurs. Concurrently, pollution, harmful algal blooms, and chemical contaminants can accumulate in seafood and threaten both ecological and public health.

This session takes a social science perspective to examine the complex human-environment relationships that define coastal fisheries under changing environmental conditions. Presentations will explore how social, economic, and cultural factors mediate community vulnerability and resilience to climate- and contaminant-related health risks. Topics include perceptions of environmental and health risks, adaptation strategies in fishing practices, and equity considerations in coastal resource management.

By integrating social science approaches with environmental and public health research, this session will highlight the relationships between ecological change, human livelihoods, and health outcomes. The goal is to advance an interdisciplinary understanding that informs both policy and practice, ensuring that the needs and voices of fishing communities are central to addressing the health impacts of climate change and contamination in coastal regions.

Resilience at the intersection of environment, extreme events, built infrastructure, and health

Health outcomes are shaped by a complex interplay of environmental exposures, built environment characteristics, socioeconomic conditions, and exposure to extreme events, all of which vary spatially and over time within urban and coastal areas. Developing an understanding of this interplay is critical towards developing interventions, mitigation and adaptation strategies and ensuring resiliency of Gulf coastal communities.

The proposed session explores the complexities associated with developing this understanding of the relationships between environmental quality, built infrastructure, repetitive extreme events and health outcomes. Studies in the session will present analyses, data and correlations between air quality and health in Gulf coastal communities in addition to the impacts of flooding, hurricanes, droughts, winter storms and extreme heat on community health. Compounding impacts of multiple stressors and repetitive extreme events over a relatively short time frame will be explored in the context of demonstrated increases in chronic disease.

The session will address sociodemographic and socioeconomic drivers of health and will incorporate the impact of the built environment infrastructure on community health. Big data, machine learning, and geospatial modeling approaches that have been developed to elucidate the complex interactions between multiple stressors and health will be presented in the session. Case studies for Houston and Harris County in Texas will present a framework for potential strategies and interventions to enhance resilience to the aforementioned stressors and improve health outcomes.

From insight to action: Operationalizing remote sensing in the Gulf of America

Remote sensing technologies used on platforms such as uncrewed aircraft systems (UAS), traditional crewed aircraft, satellites, and ocean-based sensors are transforming how we assess and respond to critical challenges in the Gulf. These tools have significantly advanced our ability to tactically respond to emergency operations, evaluate the impacts of low-frequency, high-consequence events (e.g., hurricanes, oil spills), monitor restoration efforts (e.g., wetlands, barrier islands), forecast Sargassum landings, and study ocean processes and species of conservation concern such as marine mammals and sea turtles.

Despite growing accessibility within academic, governmental, private industry, and natural resource management communities, challenges exist in moving from methods development to implementation and use by decision makers. Common barriers include selecting appropriate technologies, mobilizing and deploying equipment in dynamic environments, access to trained personnel, and the storage, processing, and delivery of data in formats that are actionable for decision-makers within an operational response timeline. To maximize the benefits and ensure remote sensing data streams are being transformed into decision-ready tools for coastal resilience, marine life management, hazard response, and ecosystem protection, leaders in the field are collaborating and sharing lessons learned to leverage interdisciplinary expertise and improve future deployments.

Attendees will hear case studies from leading practitioners deploying remote-sensing systems in real-world applications. The session will also feature a facilitated panel discussion on overcoming persistent challenges—such as resource availability, data latency, and training. Emphasis will be placed on practical pathways for integrating remote sensing into agency operations, cross-sector partnerships, and long-term planning. Participants will leave with actionable insights and tools to operationalize these technologies in their own work, advancing both science and decision-making across the Gulf.

Data Collection, Application and Synthesis

Researchers, environmental managers, and policymakers use information to make important decisions about the environment and inform restoration activities, among a great many other things. While several applications and data portals have been developed to address the wealth of information that has been generated, we have yet to answer the question of how to integrate, synthesize, and distribute the information now available to effectively inform environmental management, restoration efforts, future response strategies, community members, and Gulf research priorities.

Further, how can we foster more trans-disciplinary and cooperative approaches to science, decision-making, and community engagement? Data on its own will not fulfil the need and must be synthesized and served to the many Gulf audiences in a clear and compelling way if we are to achieve the goal of turning information into insight. Existing analyses and tools can be powerful instruments in effectively communicating science, and efforts are underway to develop a data management framework to support more efficient aggregation, integration, and synthesis of information in the future.

How do we advance and apply scientific synthesis to restoration efforts in the Gulf?

Scientific synthesis combines, integrates, and evaluates diverse data and knowledge from multiple sources to identify patterns, relationships, and insights within and across disciplines. Unprecedented amounts of environmental and other data from the Gulf of America have resulted from research and damage assessments related to the Deepwater Horizon Oil Spill, and the subsequent planning studies and monitoring of ecosystem and resource restoration projects. A regional synthesis enterprise can create a new understanding of the challenges and opportunities facing the Gulf ecosystem, inform natural resource stewardship and restoration, and enhance the resilience of natural and socio-economic systems to the effects of rapidly changing environmental conditions. The need for and utility of such efforts have been well-documented, and a number of initiatives have been planned or pursued in the Gulf over the past several years (e.g., NASEM Gulf Research Program, Gulf of Mexico Research Initiative (GOMRI), RESTORE Science Program Gulf Ecosystem Initiative, and retrospective literature reviews). Despite this interest and effort, no comprehensive sustained capacity for scientific synthesis has been established in the region to date.

This session will include presentations and discussions with practitioners of resource management-driven scientific synthesis from the Gulf region and other parts of the country to: 1) share project or program goals, objectives, and implementation; 2) demonstrate how the results of synthesis were applied to resource management including assessing outcomes, and 3) review lessons learned in order to inform future efforts in the Gulf.

To gain an appreciation of restoration programs advancing synthesis efforts in other regions (e.g., Chesapeake Bay, Columbia River watershed) and the challenges and opportunities they encountered, two external partners (practitioners) are invited to give extended presentations (total 60 - 90 min - two 30 min talks each with Q&A). During the subsequent session(s), regional synthesis presentations will improve our understanding of past and present efforts in the Gulf. Finally, with a more comprehensive understanding of the obstacles and opportunities for building a sustainable scientific synthesis capacity, we will convene an extended panel discussion/town hall to explore potential ways forward in the Gulf, utilizing lessons learned from regional and national activities. We invite an open dialogue with our invited speakers and the community regarding the role and value of a synthesis enterprise, how to structure monitoring and data management and leverage existing data repositories in the Gulf, what core training and capacity-building activities are needed to create the supporting infrastructure, and how will it be governed and resourced.

Activating collaborative science for a sustainable Gulf

The complex environmental challenges facing the Gulf of America, from coastal land loss to fisheries sustainability, demand science that is not just credible, but also actionable for decision-makers. This session will explore the framework of science co-production, a collaborative approach where scientists, resource managers, and other stakeholders work together throughout the entire scientific process. By equitably integrating diverse expertise and knowledge systems, coproduction ensures research directly addresses management needs and builds the trust necessary for its application.

Critical before attempting a co-production experience is building foundational relationships with potential partners. Once those relationships are in place or developing, the active practice of collaboration can begin. This session will move chronologically through the co-production lifecycle. We will begin with the critical planning and scoping phases, focusing on best practices for identifying partners and collaboratively defining relevant research questions. Next, we will examine the design of coproduced research, highlighting methods that integrate diverse data streams and stakeholder knowledge. Presenters will then share case studies on successful research implementation, discussing challenges and solutions for maintaining engagement and adapting to new information in the politically and environmentally dynamic Gulf. The final presentations will address how the outcomes of co-produced science are integrated into long-term strategic plans and adaptive management frameworks, ensuring a lasting impact on the sustainability and resilience of the Gulf's natural resources.

This session is designed for researchers, federal and state agency personnel, non-profit leaders, and industry stakeholders seeking to enhance the effectiveness of their work. Attendees will expand their understanding of the co-production process and see direct examples of how the co-production model is building successful partnerships that generate actionable science for a resilient Gulf.

Data management and sharing strategies

The goal of this session is to discuss the intersection of natural sciences data collection, storage and organization, the evolving technological landscape of data management and challenges for multi-use coordination. Through presentations, moderated conversations, and panel discussions this session will explore best practices and technical challenges/roadblocks that are encountered by data providers and data managers along with the need for data collaboration in ways that benefit and support a broader multi-use community. With the increasing number of monitoring programs, data science tools, data storage options and services available for data management, this session will continue to engage the Data Managers Forum community established at the 2024 Gulf of Mexico Conference (GOMCON).

This session will also include a dialogue between data collectors and data managers to discuss and overcome identified obstacles for data collection and processing. What technical challenges would we face when it comes to sharing/communicating our data? What are key features to provide authentic context when it comes to coordination and to articulate impacts for use of both the data and the spatial environment it describes? What does data management mean to data managers?

Presentations will speak to navigating the ever-changing landscape of data management including: use cases and impacts of technological advancements in artificial intelligence (AI) and machine learning (ML), data discovery, data quality, data accessibility, writing data management plans, securing funding for project proposals with data management aspects. The session will include moderated conversations with audience members and a panel to answer the questions posed above.

Communication and Engagement with Stakeholders

Methods in science education, communication, engagement, and extension are rapidly evolving, providing opportunities to reimagine effective methods of collaboration, communication, and engagement with youth and adults.

Using your science for community action and engagement

When scientists and communities work together, research becomes more relevant, inclusive, and grounded in the realities people face every day. This collaboration not only strengthens trust but also turns scientific research into practical solutions that address real community challenges and needs. This session is designed for undergraduate and graduate students and brings together Gulf-based scientists, educators, and community leaders to share real-world examples of how science can inform solutions, strengthen resilience, and build trust across diverse Gulf communities.

The first half of the session features a short moderated panel discussion highlighting different approaches to community engagement. These include co-designing research with local stakeholders, integrating traditional ecological knowledge, leveraging community science, and using storytelling to make science relatable and actionable. Panelists will share lessons learned, challenges faced, and creative strategies that helped them connect science with social, cultural, and policy outcomes.

The second half shifts to fast-paced lightning talks from early-career scientists or current undergraduate and graduate students who are already putting their science into practice in the Gulf. These brief, high-energy talks will show how researchers are addressing real issues through innovative outreach, education, and advocacy efforts. Throughout the session, attendees will be encouraged to reflect on their own research and identify opportunities for community collaboration.

Engaging stakeholders in developing a common framework for the Adaptive Capacities for Transformation (ACT) Initiative

In this session, the Gulf Research Program (GRP) at the National Academies of Sciences, Engineering, and Medicine will discuss the process, outcomes, and lessons learned from engaging stakeholders through its Adaptive Capacities for Transformation Initiative (ACT). Participants will gain a basic understanding of group concept mapping; strengths and weaknesses of the methodology; and learn about the shared adaptive capacity priorities in each Gulf location.

ACT is a 10-year initiative to promote transformative sciences as a strategy to achieve greater social impact with Gulf communities. Under ACT, the GRP has been building the capacity of local stakeholders to better adapt to disasters and their cumulative impact on the health and resilience of their communities. Building adaptive capacities has and will continue to involve strengthening existing and developing new assets—knowledge, skills, abilities, resources, and strategies—that communities can use to adjust to harm or damage, take advantage of opportunities, or respond to the consequences of stressors and disasters. With the promotion of transformative sciences, building adaptive capacities has and will continue to be driven by robust stakeholder engagement that accounts for the interconnectedness of assets, the structural and relational conditions of asset mobilization, and the systems and functions that underpin the health and resilience of Gulf communities.

In ACT Phase 1 (2025), the GRP engaged a diverse group of local stakeholders—nonprofits, foundations, academia, and government—from three disaster-active regions in the Gulf: Houston, New Orleans, and Mobile. Stakeholder engagement occurred through group concept mapping (GCM), a transformative-scientific methodology to reach consensus among a diversity of perspectives on a complex societal challenge. Using GCM, the GRP and stakeholders co-developed a common framework that links the capacity building of stakeholder assets to the collective action of stakeholders in advancing shared disaster-related priorities. The GRP is proposing a session with local stakeholders from all three regions that participated in the GCM process.

The session will be grounded by a demonstration of GCM with a focus on the role of stakeholder engagement and its complementarity to different aspects of transformative sciences. In following, the GRP will lead a facilitated discussion with local stakeholders on the outcomes (e.g., alignment of stakeholders on shared priorities, sharing of assets among stakeholders) and lessons they learned from participating in the GCM process.

Turning climate projections into community conversations: The art & science of scenario planning

Scenario planning has emerged as a cutting-edge tool for building community climate resilience. Unlike traditional planning approaches that assume a single future, scenario planning allows participants to consider a range of plausible futures that are based in data and evidence. In other words, scenario planning embraces uncertainty and helps decision makers to develop strategies that are effective across a range of potential outcomes. Scenarios are also a powerful community engagement tool because they translate abstract data into concrete, relatable narratives that participants can use to relate climate change to their own experiences and to develop a shared language for collective decision-making.

This session will bring together numerous climate professionals who are experienced using scenario planning in a range of contexts. They will introduce the key features of different scenario planning models, share their experiences using scenario planning in a variety of Gulf coast contexts, and discuss common challenges to implementing scenario planning in resilience building efforts.

Place-Based Education in the Gulf: An overview of initiatives, lessons learned, and ongoing efforts to show the value of learning in nature

Place-based education connects learners of all ages to the environments, cultures, and communities around them. This helps to build knowledge, foster stewardship, and inspire lasting care for local ecosystems. Recent collaborative efforts in the Gulf have advanced understanding of effective strategies for learning in natural spaces and the value of innovative partnerships between educators, researchers, and community members who use place-based approaches to spark curiosity, deepen learning, and foster a link between ecological understanding, stewardship, and decision-making.

This session will feature a series of brief presentations highlighting place-based education initiatives in the Gulf region that reach learners of all ages, including K–12 audiences, students in advanced degree programs, and engaged community members. Presenters will share lessons learned, successes, and ongoing efforts to demonstrate the value of learning in and from nature. A special emphasis will be placed on how presenters have measured success, and the evaluation approaches they have undertaken to show increases in environmental literacy.

The goal of this session is to create a rich, collaborative environment where participants can learn how to initiate new programs or strengthen existing ones. By bringing together practitioners from across the Gulf, this session will enhance existing dialogue, foster collaboration, and identify shared needs to expand the reach and impact of place-based education. Participants will leave with practical tools and inspiration to adapt their own work through the powerful lens of place-based learning in the classroom, field, and within communities across the Gulf region.

Reaching audiences where they are with the messages they need

Science literacy and understanding are increasingly central to our collective perceptions of the world around us, but it is difficult to deliver accurate, relevant, and easily understood messages while also combatting decreasing audience interest and attention spans. This session will highlight message building that resonates with audiences and affects positive behavior change including case studies of effective communication methods, innovative approaches using traditional and new media, and evaluation of outcomes.

Presentations in this session will explore successful messaging approaches related to any relevant conference topic. This includes:

- communication methods used during crisis scenarios such as the Deepwater Horizon oil spill and other pollution/discharge instances; red tide and other harmful algal blooms; hurricanes, flooding, heat, and other weather-related events; and fisheries management
- innovative presentation that uses engaging technology such as film, oral histories, podcasts, virtual reality, and other approaches designed to impart scientific knowledge to lay audiences in a memorable style
- social marketing campaigns that encourage behavior change on issues such as marine debris and species conservation

Results and lessons learned from efforts to build support for communication campaigns as a critical tool for success in restoration, conservation, and management are also of particular interest. Presentations, screening/sharing of materials developed as communication tools, panel discussions, and moderated discussions on best practices are all encouraged to develop a dynamic and interactive session. Estimated times for screenings/sharing over 15 minutes should be included in the abstract description, but additional time is not guaranteed.

From points to partnerships: Advancing Community Rating System (CRS) for resilient and flood-safe Gulf coast communities

The FEMA Community Rating System (CRS) is a voluntary incentive program that recognizes and rewards communities for implementing floodplain management practices that go beyond the minimum National Flood Insurance Program (NFIP) requirements. By reducing flood insurance premiums for residents, CRS not only offers direct economic benefits but also strengthens long-term community resilience to flooding and coastal hazards.

On the Gulf coast, where flood risks are amplified by sea-level rise, subsidence, and increasingly severe storms, CRS participation presents an opportunity to merge science, policy, and community action. Yet, many communities face challenges in fully leveraging the program—ranging from limited staff capacity to the complexity of CRS requirements and the need to effectively communicate its benefits to decision-makers and the public.

This session will convene local officials, floodplain managers, scientists, planners, emergency managers, and community leaders to exchange practical strategies for advancing CRS participation and class ratings. Topics will include:

- communicating CRS benefits in ways that resonate with elected officials, residents, and businesses
- using hazard modeling, GIS mapping, and climate projections to inform CRS activities and improve documentation
- building cross-sector partnerships to meet CRS objectives and share the workload
- success stories from Gulf Coast communities that have improved their CRS class and reduced resident flood insurance costs
- identifying training, resources, and peer-to-peer support opportunities to sustain and grow CRS engagement

Through panel presentations, case studies, and facilitated discussion, participants will share real-world lessons, identify gaps in knowledge or resources, and explore collaborative solutions. The session will actively promote integration of scientific data into community engagement strategies, aligning with GulfCon's focus on stakeholder collaboration and decision-making support.

Expected outcomes include a shared toolkit of communication strategies, a regional network of CRS practitioners, and concrete action steps to enhance flood resilience across Gulf coast communities.

Water Resources

Water quality, quantity, and management are of utmost importance to the Gulf ecosystem. The Gulf is vast and water quality patterns and trends are highly variable, both in space and time. Human activities (e.g., water use, excess nutrient inputs, sediment diversions, oil production, derelict fishing gear, etc.) and natural disturbances (e.g., storms, flooding, etc.) influence the water quality and quantity of the coastal environments within the Gulf, many of which lead to changes in physical, chemical, and biological conditions.

Hidden pathways: The overlooked contribution of small and decentralized wastewater systems to nutrient loading in Gulf waterways

Nutrient enrichment remains a major driver of eutrophication and HABs in the Gulf, yet many of the sources that deliver nitrogen and phosphorus into Gulf waters remain poorly characterized, particularly non-point sources. This session will explore the overlooked, but likely significant, contributions from decentralized and small-scale wastewater systems—including subsurface transport from onsite wastewater treatment systems (OWTS), failing septic systems, straight pipes and aerobic treatment units (ATUs) that discharge to the surface, land-applied septage and biosolids, and rural lagoon-based wastewater treatment systems—on nutrient fluxes to the Gulf and its estuaries.

While national nutrient inventories and models emphasize agriculture and major point sources, these smaller and more diffuse sources are typically absent or, if included, underestimated. Preliminary evidence from coastal watersheds (e.g., the Indian River Lagoon in Florida, coastal Louisiana, and rural Alabama) indicates that decentralized systems may deliver substantial nutrient loads, particularly where soils are sandy, the water table is shallow, or wastewater infrastructure is absent or undermaintained. In many Gulf states, surface discharges from failing systems are common, and most NPDES permits for rural wastewater systems monitor ammonia, not total N or P.

This session will highlight:

- estimates of the total nutrient load from small and decentralized wastewater systems relative to large point sources and agricultural non-point sources
- nutrient dynamics and transport mechanisms from functioning and failing OWTS
- the role of shallow groundwater and subsurface flow paths in nutrient delivery
- contributions from small lagoon-based wastewater treatment systems
- the effect of land-applied septage and biosolids on regional nutrient balances
- emerging tools for source tracking, nutrient fingerprinting, and inventory mapping
- policy and infrastructure gaps that perpetuate underestimation of these sources

We aim to identify research needs, discuss monitoring and modeling approaches, and engage regulators, researchers, and practitioners in shaping more accurate nutrient loading and apportionment in the Gulf region. By bringing attention to these underrepresented sources, the session will foster more comprehensive strategies for nutrient reduction and coastal protection.

Integrating artificial intelligence with data and modeling for water resource management

Artificial intelligence (AI) is increasingly being applied to the study and management of water quality and quantity in the Gulf ecosystem. The capability of AI to aggregate, interpret, and analyze large and diverse environmental datasets is providing new ways to investigate how both anthropogenic and natural drivers affect the Gulf ecosystem. An area of scientific interest is the integration of AI with hydrodynamic, biogeochemical, and ecosystem modeling approaches to improve environmental forecasting and resource management.

Recent developments have expanded the use of AI in environmental monitoring, assessment, and synthesis. Artificial intelligence enables the discovery and analysis of agency datasets relevant to water resources. However, AI approaches do not yet interface with predictive models and tools that support and communicate public and management decisions such as recreational water use, water quality forecasting and flood control operations.

This session will feature recent research and technological developments that leverage AI for applications such as environmental projections and combining satellite observations with modeling to support decision-making. A second focus area will be the current limitations of AI in accessing and utilizing the results of models, which limits the ability to provide quick and easy AI-assisted answers to important questions for Gulf community members, such as up-to-date and complete beach closure information. By sharing current findings and identifying areas where further research is needed, the session seeks to advance the synthesis of AI and modeling frameworks in support of effective water resource management in the Gulf region.

Habitat Restoration and Stewardship

Effective habitat management and restoration in the Gulf is critical for the sustainability of its many living resources (including human populations). Addressing threats and stressors to coastal habitats and living coastal marine resources is a cornerstone of ecosystem restoration. There is a great need to understand how habitat management and restoration support the long-term development of community structure and function and how human linkages and behaviors impact project success.

Vegetation, carbon, and change: Land cover dynamics and habitat restoration in the U.S. Gulf coast

Vegetated ecosystems across the U.S. Gulf coast—including forests, wetlands, marshes, and grasslands—are undergoing rapid transformation due to land use pressures, climate change, sea level rise, and increasing development. These landscapes store vast amounts of carbon, regulate regional hydrology, support biodiversity, and sustain local economies. However, their capacity to provide these services is increasingly compromised by degradation and fragmentation.

This session explores how land use and land cover change (LULCC)—such as deforestation, urban expansion, fire, saltwater intrusion, and land conversion—are reshaping carbon and water dynamics, ecosystem structure, and restoration priorities in the Gulf coast region. Of particular interest are the consequences of these changes for carbon storage, greenhouse gas emissions, and long-term ecosystem resilience.

Equally critical is the role of habitat restoration and stewardship in reversing ecosystem degradation, enhancing carbon sequestration, and supporting sustainable communities. Effective restoration and management practices must integrate ecological, climatic, and social dimensions to ensure long-term success.

We invite contributions that:

- quantify the impacts of LULCC on carbon fluxes, biomass, and soil carbon across coastal and inland vegetated ecosystems;
- assess the role of habitat restoration in enhancing carbon sequestration, water retention, and biodiversity;
- evaluate how community engagement, stewardship practices, and adaptive management influence restoration outcomes;
- apply remote sensing technologies (e.g., MODIS, ECOSTRESS, SMAP, Landsat, Sentinel, GEDI), field-based measurements (e.g., flux towers, vegetation surveys, soil cores), and modeling approaches to understand ecosystem changes and restoration effectiveness;
- highlight interdisciplinary and cross-sectoral strategies for climate-smart habitat management in the Gulf and comparable coastal regions.

By bridging biophysical science with practical restoration and stewardship, this session aims to build an integrated understanding of how to protect and enhance the Gulf's carbon-rich ecosystems amid growing environmental pressures.

Innovations in oyster shell recycling and oyster reef restoration

This session will provide an opportunity to bring together the community of practice in oyster shell recycling and oyster reef restoration from around the Gulf to share lessons learned and best practices. The demand for oyster shell for restoration projects remains high, but costs and logistics associated with shell recycling programs are significant. This session will include discussions of challenges, best practices, and issues around scaling these efforts to meet the demand.

Oysters are critical to the health of the Gulf region as a staple food and highly valued commercial fishery, as well as the water quality, erosion control, and habitat benefits they provide. Due to historic overharvest and decline of oyster populations, restoration is important to rebuilding and maintaining oyster reefs. This session aims to create an atmosphere of peer-to-peer learning in the oyster conservation and restoration community, where practitioners and researchers can come together to share wisdom and learn from each other.

We welcome presentations on project case studies and lessons learned, innovations in design and materials, findings from project monitoring and evaluation, outreach and education efforts, and ongoing challenges in the field.

Restoring estuarine and marsh habitat with dredged material

The beneficial use of dredged material (BUDM) involves repurposing dredged sediment for habitat restoration, recreation, and resilience initiatives. By treating this material as a resource rather than waste, interest in BUDM opportunities has reached an all-time high. This session invites resource managers and restoration practitioners from all regions and sectors who are implementing BUDM projects to share their experiences, learn from others, and engage with peers.

Inquiring minds want to know:

- What application techniques are you using, and for what types of projects?
- Were desired outcomes achieved?
- Was adaptive management required?
- What are the characteristics of the dredged material?
- Were there permitting challenges?
- How are you monitoring success?
- Who are your partners?

Just as rising tides lift all ships, sharing lessons learned, including both successes and challenges, strengthens our collective ability to use BUDM effectively and sustainably.

Living Resources

Living Resources encompasses terrestrial and aquatic organisms ranging from bacteria to megafauna. Management of these important and sometimes understudied resources is complicated by insufficient data on biology, ecology, and poorly understood vulnerability to various threats and stressors, including anthropogenic impacts. Complex and diverse life histories, population trends, and responses to natural and anthropogenic stressors have and will remain the focus of science and management to correctly guide policy decisions.

Wildlife and fisheries status and trends and species conservation

In the Gulf of America region, a number of innovative projects led by both state and federal partners to restore and conserve living resources have been completed or are underway. This session will present recent or current studies or projects that focus on management challenges regarding issues affecting fish and wildlife. Examples of particular interest include innovative approaches to the management or mitigation of invasive plant or animal species, coral restoration, other species restoration or management, marine debris, and bycatch reduction in the Gulf of America. Presenters will focus on techniques to overcome management challenges and provide available results, insights, recommendations, and anticipated next steps that may support future project implementation plans.

Cooperative research and management of Fish Spawning Aggregations in the Gulf

Collaborative approaches involving researchers, managers, and living marine resource users are needed to meet the research and monitoring needs of living resources in the Gulf, especially in offshore waters. This session will bring together members of these communities to discuss cooperative monitoring and assessment of Fish Spawning Aggregations (FSAs).

The session will include presentations by invited speakers who will share their experiences and perspectives on collaborative research, characterization, monitoring and management of FSAs. Topics will include facilitating engagement with fishermen, and how collaboration can benefit and inform policy makers, managers and other key stakeholders.

Speakers will describe current research activities supported by RESTORE, provide an overview of past research and outcomes, and share information about similar work in other regions. Presentations will be followed by a panel of representatives from different sectors (state and federal government, fishers, non-profits, academics) who have been involved in cooperative research on FSAs. Panelists will describe their experiences and lessons learned, and attendees will have the opportunity to ask questions and share their own perspectives.

Relationships and underlying mechanisms between environmental trends and variability and fisheries populations

This session focuses on understanding estuarine finfish and shellfish population dynamics in relation to environmental trends and variability. Over the last decade, there have been significant strides made in quantifying and linking trends in populations and environmental drivers, which has provided new data and insights to fisheries and environmental managers. However, threats to economically and ecologically important species persist and may be intensifying due to large magnitude changes in estuarine hydrography and water quality, habitat loss, and increasing fishing pressure.

Thus, the overarching research question we seek to address in this session is: How do these populations vary in response to changes in predominant biophysical stressors? Four major research themes and sub-questions are posed for the session:

1. Environmental change: How do fisheries populations change with a changing environment?
2. Thresholds for fisheries species: What are the environmental thresholds for changes?
3. Resource management: What are the linkages between environmental stressors, fisheries ecosystem services, economic systems, and management actions?
4. Environmental and fisheries prediction: Given knowledge of past and present trends and potential change scenarios, what will be the impact to fisheries populations and the implications for managers?

In addition to research presentations, we invite presentations from managers with observations and perspectives for how research to address these themes may be incorporated into decision-making for fisheries, habitat, and water quality management.

Science, Practice and Policy of Integrated Local and Regional Planning

As investments are made to promote the recovery, restoration and protection of the Gulf Coast's ecosystems and economies, sound science is needed to develop systems-level, integrated strategies that support local, state, and regional planning; adaptive management; and science-based decision-making. At the same time, for successful application of science it is important for the scientific community to understand the needs of managers and policy makers and the roles of science in informing decisions and practices.

Decision-focused, integrated approaches to maximize the benefits of restoration and management across the Gulf coast

Coastal restoration and management challenges across the Gulf coast are complex, spanning diverse ecosystems, species, and communities, and complicated by significant uncertainty from environmental change, data gaps, and evolving societal needs. This session highlights how co-developed, decision-focused, integrated approaches can bridge science, management, and stakeholder priorities to maximize restoration and resilience benefits.

This session will highlight examples and case studies in integrated decision-making from large scale restoration projects such as the Chandeleur Islands Restoration, coastwide avian habitat monitoring, nature-based solutions at MacDill Air Force Base, and other natural resource and climate adaptation applications. The session will illustrate and explore effective methods for collaborative, interdisciplinary teams to co-develop metrics, tools, and decision frameworks for guiding restoration planning, design, and adaptive management. A specific emphasis will be examining how ecological metrics—such as seagrass resilience and bird population performance— can be linked with scenario-based modeling and decision analysis to identify high-performing strategies across a range of future conditions.

The session will explore how both proven and evolving tools such as co-production, structured decision-making, integrated modeling, remote sensing, modern analytics such as artificial intelligence, and numerical models can be used within stakeholder-informed guidance documents. This approach can create transparent, adaptable pathways to maximize ecological, and community objectives, ultimately enhancing the resilience and sustainability of the Gulf coast.

Nature-Based solutions for compound flooding in Gulf coast estuaries: Advancing modeling and decision-making

This session focuses on the role of nature-based solutions (NBS) in mitigating compound coastal flooding in estuarine systems. With sea level rise and intensifying storm events threatening communities across the U.S. coastline, it is increasingly critical to integrate science with planning to develop effective flood risk reduction strategies.

The session highlights Mobile Bay, Alabama, as a case study of national relevance. This shallow estuary, bounded by urban development and natural landscapes, has experienced devastating storm impacts and a loss of nearly half its emergent wetlands over the past three decades. These wetlands, critical to ecosystem services and coastal flood buffering, are now diminishing at an unprecedented rate, leaving the region more vulnerable to coastal floods. Despite growing recognition of their value, there remains a lack of comprehensive understanding about the extent to which NBS, such as wetland restoration, can reduce flooding impacts, particularly under compound hazard scenarios.

This session builds on efforts to couple the hydrologic, hydrodynamic and biological models, enabling rigorous evaluation of NBS, gray infrastructure, and policy interventions under sea level rise and storm scenarios. By actively involving planners, engineers, and natural resource managers throughout the process, this project aims to ensure that science directly informs decisions that enhance both flood resilience and ecosystem sustainability.

We welcome submissions across a range of topics, including coupled hydrologic–hydrodynamic modeling, evaluation of NBS and hybrid infrastructure, decision-support tools, policy integration, stakeholder co-production, and methods for transferring insights to other coastal regions. While the session will feature work from Mobile Bay, Alabama, we encourage contributions from diverse geographic settings to foster broad dialogue and knowledge exchange. Join us in exploring how science, modeling, and collaborative planning can support more resilient and adaptive coastal futures.

Emerging Issues

Environmental conditions, natural, and other systems drivers are changing in the Gulf region. Whether due to natural or man-made conditions, scientists and resource managers must study, understand, and address emerging environmental issues to ensure effective planning and management.

Leveraging emerging technologies for living resource management in the Gulf

The sustainable management of natural resources in the Gulf of America faces complex challenges, including changing climate and ocean conditions, habitat loss and degradation, and balancing competing user demands. This session will explore the rapidly evolving landscape of technological innovations that offer promising solutions for more effective and adaptive management. We will highlight advancements in areas such as remote sensing, artificial intelligence (AI) and machine learning (ML), autonomous vehicles, and advanced data analytics.

The session will feature presentations and panel discussion on how these technologies are being developed and applied to enhance data collection, improve stock assessments, monitor habitats, and facilitate adaptive management strategies. Specific topics include: the use of satellite imagery and drones for habitat mapping and species detection; AI-driven analysis of acoustic data for marine mammal monitoring; autonomous vehicles for comprehensive seafloor surveys; and the integration of diverse data streams into models for fisheries management. Our aim is to foster collaboration between researchers, resource managers, and technology developers. By showcasing successful case studies and identifying future research and development needs, this session will provide a platform for sharing best practices and accelerating the adoption of cutting-edge tools to ensure the stewardship of the Gulf ecosystem. We encourage submissions that demonstrate practical applications, discuss challenges in implementation, and propose collaborative pathways forward.

Impacts from acute, chronic, or multi-stressor effects on the Mississippi Sound and Bight ecosystem

The Mississippi Sound and Bight (MSB) is a dynamic portion of the northern Gulf of America, roughly bounded by the Mississippi River in the west and Apalachicola in the east, and is characterized by sheltered estuaries, with connectivity to the shallow continental shelf through barrier island inlets and heavy riverine forcing from the Mississippi, Mobile-Tensaw complex, Pascagoula, and Pearl Rivers. The MSB provides nursery grounds for dolphins, sharks, and many fish and shellfish and supports booming tourism and fisheries industries, with fisheries of note including brown shrimp, blue crab, gulf menhaden, and eastern oyster.

While the MSB ecosystem has always experienced tropical storms, seasonal stratification, and various stressors—like harmful algal blooms, bottom hypoxia, and coastal erosion—the frequency of these stressors is increasing, largely due to anthropogenic activity, including the management of Mississippi River discharge and sediment diversions. Furthermore, human modifications to the estuaries and coasts of the MSB that attempt to mitigate land loss and extreme flood events, create unintended physical and ecological challenges for the system.

This session welcomes presentations on projects that seek to understand both chronic and acute stressors—including multi-stressor effects—on the MSB ecosystem using experimental, field, and modeling approaches. Projects that can inform management solutions that mitigate negative effects of these stressors are especially welcomed.

Coastal-Ocean Processes and Physical Oceanography

Coastal ocean processes and physical oceanography encompass a wide range of dynamic phenomena, including tidal currents, wave-driven circulation, and estuarine mixing. These processes are critical for understanding sediment transport, nutrient cycling, and ecosystem health in nearshore environments. For example, studies of upwelling systems and internal wave propagation reveal how physical forces influence biological productivity and climate interactions. Together, these topics highlight the interconnected nature of coastal and global ocean dynamics, offering vital insights for advancing marine science.

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Description coming soon