CERF 2025 Scientific Sessions

Advances in Estuarine and Coastal Modeling

Keywords: Coastal Engineering;Ecological Modeling;Estuarine and Coastal Modeling;RestorationSea Level Rise

Description: This session focuses on recent advancements in estuarine and coastal modeling (ECM), showcasing innovative research and applications at the intersection of ECM and CERF. It welcomes both returning and new participants from the previous Estuarine and Coastal Modeling (ECM) conferences. Topics include a wide range of cutting-edge developments such as storm response, climate change resilience, ecosystem modeling, operational forecasting, coupled systems, numerical techniques, water quality, sediment transport, data analysis and visualization, cloud computing, machine learning, and regional modeling applications.

Conveners: Matthew Bilskie, University of Georgia; Pengfei Xue, Michigan Technological University

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Advances in inundation monitoring and modeling using machine learning

Keywords: Hydrodynamics and Hydrology;Estuarine and Coastal Modeling;Monitoring;Remote Sensing;Urban Coastal and Estuarine Ecosystems

Description: Recent innovations coupling remote sensors and modeling with technological advances in edge detection and machine learning algorithms has enabled development of next generation flood observing and prediction systems. Given the recent global access to online artificial intelligence toolsets, there has been an increased interest in marine research insights derived from acoustic, image, and video training samples as alternative inputs. Novel research applications of artificial and convolutional neural networks as new artificial intelligence-augmented approaches to modeling and monitoring ocean, estuarine, and/or riverine water elevations and water quality are the intended emphasis of this session.

Conveners: Derek Loftis, Virginia Institute of Marine Science; Russell Lotspeich, US Geological Survey; Sridhar Katragadda, City of Virginia Beach

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Advancing coastal carbon science: tools, innovations, and collaborative approaches

Keywords: Carbon;Collaborative Research/Co-Production;Environmental DNA (eDNA);Indigenous Knowledge;Nature-Based Solutions

Description: We solicit presentations that advance knowledge of coastal carbon cycling in a changing climate. Contributions might include synthesis and meta-analyses of coastal carbon data, remote sensing innovations monitoring carbon stocks and fluxes in dynamic coastal systems, machine learning applications that enhance data interpretation, environmental DNA (eDNA) techniques linked to carbon cycling, or other novel advancements that provide insights into carbon dynamics including soil carbon accumulation, greenhouse gas emissions, and long-term sequestration potentials. We particularly encourage presentations that integrate carbon science with conservation efforts, adaptive management, or community-based co-production. This session is designed to showcase the latest tools, techniques, and collaborative approaches.

Conveners: Lillian Aoki, University of Oregon; Katya Podkovyroff Lewis, University of Oregon; Katrina Poppe, University of British Columbia; Western Washington University; Karen Adair, University of Oregon

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Are we there yet? Timelines for coastal ecosystem restoration

Keywords: Ecosystem Services;Ecosystem-Based Management;Monitoring;Resilience;RestorationSea Level Rise

Description: Restoration promises to hasten the recovery of many vanishing ecosystems, but assessment of restoration outcomes is limited by unknown recovery timelines, undefined performance metrics, and uncertainty about whether restored ecosystems can approximate natural ones. This session explores the capacity for restored coastal ecosystems to regain ecological function, the durations and spatial scales needed to achieve adequate recovery, and the challenges to defining appropriate benchmarks and restoration targets.

Conveners: Max Castorani, University of Virginia; Rachel Smith, University of California, Santa Barbara; Kinsey Tedford, Oyster Recovery Partnership

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Awash in information: leveraging big data to answer big questions

Keywords: Data Analysis; Data Mining; and Visualization;Ecological Modeling;Estuarine and Coastal Modeling;Nekton;Remote Sensing

Description: Human activity has caused historical changes to coastal systems that are projected to continue into the future in unanticipated ways. This session will explore applications of big data and machine learning in addressing some of the most pressing

questions in coastal science, appropriate for studies ranging from local to global spatial scales and/or (sub)daily to millennial temporal scales. This session is intended to foster communication across scientific and management communities by sharing novel ideas and examples of successes (and failures) in big data applications, and develop a network of colleagues working at the interface of data science and ecosystem management.

Conveners: Ryan Woodland, University of Maryland Center for Environmental Science / Chesapeake Biological Laboratory; Victoria Coles, University of Maryland Center for Environmental Science / Horn Point Laboratory; Xiaoxu Guo, University of Maryland Center for Environmental Science / Horn Point Laboratory; Christopher Rowe, University of Maryland Center for Environmental Science / Chesapeake Biological Laboratory

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Biology and conservation of horseshoe crabs and their essential habitats

Keywords: Citizen Science;Climate Change;Conservation;Invertebrates;Urban Coastal and Estuarine Ecosystems

Description: Critical habitats for horseshoe crab spawning and maturation, including estuarine beaches, mangroves, and salt marshes, are in decline throughout their global range and likely to be further diminished as a consequence of sea level rise. This session will report on current success stories and further research objectives with emphasis on 1) strategies for habitat conservation in North America and Asia, particularly in urban estuaries; 2) quantifying current and future threats and identifying global efforts that can protect habitat and species now and into the future; and 3) mobilizing traditional and local ecological knowledge to fill data gaps.

Conveners: Mark Botton, Fordham University; Ruth Carmichael, Dauphin Island Sea Lab/ University of South Alabama; Jane Brockmann, University of Florida

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Biophysical feedbacks and their role in coastal resilience

Keywords: Blue Carbon;Climate Change;Ecogeomorphology;Resilience;Sediment Accumulation/Accretion

Description: Scientists traditionally considered either biotic or abiotic forces as the primary driver of estuarine ecosystem resilience to climate change and anthropogenic disturbance. Coastal science has since transitioned to a more interdisciplinary understanding by identifying cyclical feedbacks between biota and their physical environment that stabilize coastal habitats. We welcome presentations across estuarine ecosystem types, including but not limited to: salt marshes, oyster reefs, mangroves, dunes, seagrass meadows, peatlands/peat bogs, tidal flats, and tidal freshwater wetlands.

Presentations with specific focus on the interconnectedness between ecosystems and/or their role in coastal ecosystem resilience are of particular interest.

Conveners: Serina Wittyngham, University of North Florida; Erin Peck, ORISE

Carbon cycling in estuaries

Keywords: Biogeochemistry;Blue Carbon;Carbon;Climate Change;Ecosystem Metabolism

Description: Estuaries play an important role in the global carbon cycle as carbon is transported and transformed between land and the ocean. The processing of carbon in estuaries also provides a useful framework for investigating a wide range of key biological and chemical phenomena, including estuarine hypoxia and acidification. This session welcomes presentations on all forms of carbon, including organic, inorganic, dissolved and particulate, and across the entire estuarine continuum: from the watershed to the continental shelf. We welcome presentations from a variety of perspectives and methods, including in situ and remotely sensed data analysis and numerical and statistical modeling.

Conveners: Alexa Labossiere, Virginia Institute of Marine Science; Seyi Ajayi, Penn State; Raymond Najjar, The Pennsylvania State University; Marjorie Friedrichs, Virginia Institute of Marine Science

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Challenge and promise of scale in coastal climate change assessments

Keywords: Climate Change;Estuarine and Coastal Modeling;Eutrophication;Management;Water Quality

Description: The challenge and promise of scale in climate change and other management assessments in coastal watersheds is being driven by newly available high resolution land use, and advances in monitoring, modeling, machine learning, and statistical analyses. These techniques are now being applied in next generation water quality and living resource models. Other significant scale advances are in computational power, data availability, and the interest of decision makers to resolve pollution management problems at local scales. These technological and societal decision making forcings are driving the need for higher spatial resolution models and analyses in the Chesapeake and other coastal watersheds.

Conveners: Lewis Linker, U.S. EPA Chesapeake Bay Program Office; Joseph Zhang, VIMS; Gopal Bhatt, Penn State Chesapeake Bay Program Office; Jesse Bash, U.S. EPA ORD

Climate-Induced Disruptions to Coastal Crustacean Populations

Keywords: Climate Change;Economy/Economics;Fisheries;Management;Population/Community Ecology

Description: Climate shifts impact valuable coastal and estuarine crustacean resources. This session seeks to bring together scientists working on coastal crustacean populations and those affected by these changing resources. Our goal is to share lessons learned to support effective management of these populations under rapidly changing coastal conditions. Shared insights of crustacean populations, observed trends, ecological effects, challenges for long-term surveys, new strategies for aquaculture, new methods for assessment, and the effects of changing harvests on the coastal communities that depend on them, are all welcome topics in this forum.

Conveners: Tom Ihde, Morgan State University; Amanda Bevans, Morgan State University

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Coastal forest dynamics and resilience in times of global change

Keywords: Climate Change;Climate Adaptation;Coastal Forests;Resilience

Description: This session will explore the dynamics and resilience of coastal forest ecosystems as they cope with climate change, land use change, and other stressors. We are particularly interested in temperate swamps and coastal forests. Topics of interest may include (but are not limited to): effects of salinization and sea level rise on coastal forests, land use and management practices, socio-ecological resilience, feedback loops, biogeochemistry, restoration, ecosystem services, and the use of novel tracers and methods. Observational, experimental, modeling, and community-based research are all welcome. We are particularly interested in research with applications to scaling, prediction, resilience, and sustainability.

Conveners: Karen Knee, American University; Amr Keshta, Smithsonian Environmental Research Center; Keryn Gedan, George Washington University; Rodrigo Vargas, University of Delaware; Melinda Martinez, U.S. Geologic Survey

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Coastal mapping data collection and classification for research and management

Keywords: Benthic Ecology;Data Analysis; Data Mining; and Visualization;Ecosystem-Based Management;Mapping ;Other

Description: Mapping coastal and shallow waters allows for greater multidisciplinary understanding of dynamic coastal processes and function across spatial and temporal scales. The Coastal and Marine Ecological Classification Standard (CMECS) further

advances our understanding by providing a "common language" for consistently organizing and describing marine and lacustrine ecosystems. The resulting data and information facilitate communication and meaningful stewardship of our coastal and nearshore resources and systems. This session builds on previous CERF sessions. We invite presentations on shallow water mapping and/or CMECS, including research, methodologies, map products, case studies, challenges, understanding systems in the context of global change, and management applications.

Conveners: Monique LaFrance Bartley, National Park Service; Kate Rose, Northern Gulf Institute at Mississippi State University; Matt Dornback, NOAA Office for Coastal Management

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Connectivity of estuarine-dependent species

Keywords: Animal Behavior;Connectivity;Fish Ecology;Invertebrates;Larval Ecology/Transport

Description: This session examines how mobile estuarine-dependent vertebrates or invertebrates connect ecosystems across freshwater-to-marine continua. Contributions may examine behavioral ecology, trophic linkages, larval dispersal, and mobile organisms as nutrient vectors. Presentations may explore the entire salinity gradient or one biome (e.g., coastal, shelf, oceanic, or riverine phases). Interdisciplinary approaches integrating tracking methodologies (hard part chemistry, tissue isotopes, telemetry, acoustics) or coupled biophysical modeling to assess connectivity dynamics are encouraged. Presentations on cultural and economic dimensions of estuarine-dependent mobile species are also welcome. Evolving paradigms, emerging methodologies, and the future of mobile species in the face of global change will be highlighted.

Conveners: Benjamin Walther, Texas A&M University - Corpus Christi; Sharon Herzka, UT Austin; Karin Limburg, SUNY College of Environmental Science and Forestry; T. Reid Nelson, George Mason University

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Co-production of knowledge and recommendations for coastal restoration and management

Keywords: Collaborative Research/Co-Production;Local Ecological Knowledge;Management;RestorationSea Level Rise;Traditional Ecological Knowledge

Description: This session focuses on real-world examples of co-produced knowledge and/or recommendations for coastal restoration and management that have been successfully implemented to address coastal challenges. Topics include approaches to effectively engage end-users and reach consensus among diverse perspectives, integrate

TEK/LEK into recommendations, and incorporate co-produced knowledge into management decisions and actions. Presenters and attendees are encouraged to participate in the adjoining collab session, which will facilitate discussion and exploration of topics and strategies introduced in this session. This session should be of interest to restoration practitioners, scientists, managers, and others seeking to achieve equitable and effective coastal resource management.

Conveners: Olivia Caretti, Oyster Recovery Partnership; Jennica Moffat, Oyster Recovery Partnership

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Demystifying the nitrogen cycle: advances in quantifying nitrogen cycling processes

Keywords: Biogeochemistry;Marshes;Nutrient Cycling;Oyster Reefs;Seagrasses and Other Submerged Aquatic Vegetation

Description: Coastal ecosystems are hotspots for nitrogen cycling, prompting significant efforts to improve methods for measuring nitrogen cycling rates. Recent advances in isotope methods and mass inlet membrane spectrometry have improved our ability to measure in situ N cycling processes, yet room for improvement still exists. To better constrain N cycling estimates, we seek studies utilizing or building on the isotope pairing technique, push-pull methods, or other methodological advances in coastal ecosystems, including seagrass meadows, oyster reefs, and salt marshes. This session will interest scientists looking to focus on advances in methodology, lessons learned, and future directions for coastal nitrogen science.

Conveners: Anna Mikulis, University of New Hampshire; Lillian Aoki, University of Oregon; Nia Bartolucci, EPA

Disturbance as a driver of ecological dynamics in seagrass habitats

Keywords: Anthropogenic Impacts;Benthic Ecology;Climate Change;Ecosystem Services;Seagrasses and Other Submerged Aquatic Vegetation

Description: Disturbance plays a key role in shaping the structure and function of many seagrass ecosystems globally. Whether large or small, biotic or abiotic, natural or anthropogenic, disturbance can influence all facets of seagrass ecosystems, from biogeochemical cycles to species assemblages to geomorphology. This session should be of interest to anyone studying disturbance, in its many forms, and the role it plays in shaping seagrass habitats and communities. We welcome presentations addressing the effects of disturbance on any aspect of seagrass ecology, from genetics to ecosystems and functions to services, across various spatial and temporal scales.

Conveners: Robert Johnson, University of Wisconsin-Madison; Laura Reynolds, University of Florida; Savanna Barry, UF IFAS Nature Coast Biological Station

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Drones for coastal and estuarine research and management

Keywords: Mapping ;Monitoring;Remote Sensing;Uncrewed Aircraft Systems/Drones

Description: Uncrewed aerial systems (UAS; or drones) continue to expand our ability to collect data at high spatial and temporal resolution. UAS technology is being widely implemented to map and monitor coastal environments to assess and predict their resilience and recovery to anthropogenic and climate impacts and generate ecologically relevant data for coastal resource management. This session will highlight applications of UAS across coastal environments and disciplines to answer ecological questions and support resource management. The session should be of interest to anyone applying or seeking to apply UAS to their coastal research or resource management objectives.

Conveners: Justin Ridge, North Carolina Coastal Reserve & NERR; Brandon Puckett, NOAA National Centers for Coastal Ocean Science; Erik Smith, University of South Carolina

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Eco-evolutionary dynamics in coastal ecosystems under global change

Keywords: Genetics/Genomics;Population/Community Ecology

Description: Anthropogenic change is rapidly altering coastal ecosystems, and exposure to global change could induce meaningful evolutionary outcomes. Despite decades of study, the effect of organismal evolution on ecosystem dynamics (and vice versa) has rarely been investigated in coastal ecosystems (and beyond). This fundamental gap and lack of integration between ecosystem ecology and evolutionary processes may limit and/or vastly underestimate the potential response of organisms to accelerating global change and, in turn, the effect of evolutionary responses of organisms on ecosystem function. This session invites participants working at any scale (i.e., "-omics" to ecosystems) interested eco-evolutionary dynamics in coastal ecosystems.

Conveners: Thomas Mozdzer, Bryn Mawr College; Megan Vahsen, University of Georgia; Mike Blum, University of Tennessee - Knoxville

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Ecological forecasting for coastal management

Keywords: Collaborative Research/Co-Production;Ecological Modeling;Management;Resilience;Water Quality

Description: Ecological forecasts provide critical information to managers about coastal hazards, such as harmful algal blooms, hypoxia, pathogens, water quality, and/or species distribution, to make informed management decisions in near-real time. While ecological forecasts might be regional or hazard specific, the methods, models, data assimilation, and delivery, can be adapted and applied across coastal hazards and regions. We seek abstracts that address the full spectrum of ecological forecasting, from ecological model development, data assimilation, validation, application, and end-user co-development/engagement and delivery, and which apply the principles of ecological forecasting to a variety of coastal hazards and water quality issues.

Conveners: Alexandria Hounshell, NOAA NCCOS; Andrew Leight, Cooperative Oxford Laboratory, NOAA, National Ocean Service, Oxford, MD; Erik Davenport, NOAA NCCOS; Gregory Dusek, National Ocean Service, NOAA, Silver Spring, MD

Enhancing coastal marsh resilience through innovative modeling solutions

Keywords: Climate Change;Climate Adaptation;Estuarine and Coastal Modeling;Nature-Based Solutions;Wetlands

Description: Coastal marshes provide essential ecosystem services, such as erosion control and storm surge mitigation, yet uncertainties remain in predicting their responses to sea-level rise (SLR). Advances in integrative modeling, incorporating hydro-morphodynamic, ecological, and biological interactions, have improved our understanding of marsh dynamics. This session seeks to showcase cutting-edge research, foster interdisciplinary collaboration, and advance coastal wetland modeling. We encourage contributions that explore innovative modeling techniques and their practical applications for informing coastal resilience strategies in the face of climate change.

Conveners: Ramin Familkhalili, NOAA NCCOS; Kevin Buffington, USGS; Christine Buckel, NOAA National Centers for Coastal Ocean Science; Navid Tahvildari, Old Dominion University

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Environmental stressors impeding restoration in estuaries: HABs and more

Keywords: Climate Change;Estuarine and Coastal Modeling;Harmful Algal Blooms;Water Quality

Description: Environmental stressors in estuaries can impede restoration at present and into the future. Stressors include long term trends in water quality metrics, the occurrence of harmful algal blooms, rising water temperatures, sea level rise and coastal flooding, and estuarine acidification. This session provides a forum for assessing current understanding of these stressors, and implications for estuarine ecosystem structure and function.

Presentations that include modeling and observational studies of environmental change in estuaries, and projections of future states are encouraged. Also encouraged are studies that provide assessments of long-term historical and observational data of these stressors.

Conveners: Margie Mulholland, Old Dominion University; Eileen Hofmann, Old Dominion University

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Estuaries and coasts as wildlife habitat

Keywords: Animal Behavior;Conservation;Population/Community Ecology;Spatial Ecology;Wildlife

Description: Coastal transition zones between terrestrial and ocean ecosystems are important but often under-recognized habitat for wildlife. Understanding the use of these ecosystems is critical to their conservation and of the species that use them. We invite presentations on ecology of any estuarine or coastal wildlife species, such as marine mammals, sharks, sea turtles, alligators, mammalian meso-predators, and birds. Topics may include abundance and distribution, species composition, food web structure, resource selection, and anthropogenic impacts. We encourage conversations among researchers who identify as wildlife ecologists and those who are broadly interested in ecosystem functions.

Conveners: Beth Darrow, Bald Head Island Conservancy; Ruth Carmichael, Dauphin Island Sea Lab/ University of South Alabama; Mark Woodrey, Mississippi State University; Hannah Henry, Auburn University; Matt Ramirez, University of North Carolina Wilmington; Marae West, Sandbar Oyster Company

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Estuaries and coasts in transition with declining nutrient loads

Keywords: Education and Outreach;Eutrophication;Management;RestorationSea Level Rise;Water Quality

Description: After decades of research focus on increasing nutrients, a growing number of coastal systems are now experiencing decreasing nutrient inputs. This session will examine the full spectrum of changes associated with this transition. This may include understanding: (a) decision-making and other drivers associated with declining nutrients, (b) ecological responses to changes in nutrient loading, (c) social and economic effects, and (d) how the effects of declining nutrient loading can be understood in the context of global climate and demographic changes.

Conveners: James Hagy, U.S. Environmental Protection Agency; Sawyer Balint, Boston University; Jacob Carstensen, Aarhus University; Autumn Oczkowski, US EPA, Office of Research and Development

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Estuarine and coastal plankton communities: sentinels of evolving ecosystems

Keywords: Biological Oceanography;Harmful Algal Blooms;Phytoplankton;Plankton Ecology;Zooplankton

Description: Plankton communities respond quickly to changes in aquatic ecosystems owing to their intermediary position between inorganic and organic matter resources and upper trophic levels and their short life cycle. However, despite their short life cycle, they profoundly influence the structure and function of estuarine and coastal habitats. The goal of this session is to highlight studies on planktonic communities, from virio- and bacterioplankton to ichthyoplankton, their interactions, impacts on coastal and estuarine communities, and the influence of ecosystem stressors (e.g., dams, pollution, climate change).

Conveners: Pedro Morais

Estuarine and coastal microbial communities under eutrophication and climate change

Keywords: Anoxia and Hypoxia;Anthropogenic Impacts;Microbial Ecology;Nitrogen;Ocean and Coastal Acidification

Description: Estuarine and coastal microbial communities are normally subject to varying environmental conditions of temperature and salinity, but eutrophication and climate change have caused additional stresses of increasing temperatures, deoxygenation, and acidification. Due to their short generation times and diverse metabolic capabilities, microbial communities (including bacteria, archaea, and micro-eukaryotes) can readily adapt to exploit the available environment. Molecular methods, including DNA metabarcoding, genomics, and bioinformatics, coupled with microscopy, flow cytometry and others are the key to characterizing these communities. This session addresses the broader issue of estuarine and coastal anthropogenic impacts on important organisms not often considered in this context.

Conveners: James Ammerman, Long Island Sound Study/NEIWPCC; Luciana Santoferrara, Department of Biology, Hofstra University

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Estuarine Nutrient Reduction Strategies: Impacts and Insights

Keywords: Anthropogenic Impacts;Ecosystem Services;Management;Nutrient Cycling;Water Quality

Description: This session explores the effectiveness of nutrient reduction programs on estuarine health implemented globally. Presentations will focus on strategies employed—such as upgrades to wastewater treatment plants, changes in land use practices, and water reuse—along with anticipated benefits, including improved water quality, decreased harmful algal blooms (HABs), and healthier food webs. We encourage discussions on successes, challenges, and innovative solutions to better understand and manage nutrient loading in estuarine environments.

Conveners: Tamara Kraus, U.S. Geological Survey; Ariella Chelsky, San Francisco Estuary Insitute; Andrea Jaegge, U.S. Geological Survey

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Estuarine research in the 'omics age

Keywords: Biological Invasions/Invasive Species;Environmental DNA (eDNA);Genetics/Genomics;Molecular Ecology;Trophic Biomarkers

Description: Estuarine research has fully embraced the 'omics era, leveraging information-rich molecular datasets to address an increasingly diverse array of questions. For microbial ecology, 'omics tools are used to investigate nutrient cycling, greenhouse gas production, antibiotic resistance, and interactions with plants and animals. As tracers, they are used to study dispersal of materials, food-web dynamics, and eDNA-based community assessments. As predictive tools, they are used to assess restoration efforts, habitat disturbances, and ecosystem responses to climate change. This session invites presentations that employ 'omics approaches for estuarine ecology and biogeochemical cycling, coastal resource management, and forecasting changes in estuaries undergoing transition.

Conveners: Byron Crump, Oregon State University; Jennifer Bowen, Northeastern University

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Estuarine, Coastal and Shelf Sedimentary Processes, Products, and Dynamics

Keywords: Estuarine and Coastal Modeling;Geology;Geomorphology;Sediment Accumulation/Accretion;Sediment Transport

Description: Estuaries, coastal, and shelf settings are some of the most dynamic marine sedimentary systems. The effects and products of these processes are manifest in many

ways. This session will broadly focus on the link between sedimentary process and product, with special emphasis on mechanisms of sediment deposition, erosion, sediment mixing, and record of processes in modern strata; the link between sedimentary processes and benthic habitats; and other relevant estuarine, coastal and shelf sedimentary dynamics.

Conveners: Timothy Dellapenna, Texas A&M University; Courtney Harris, Virginia Institute of Marine Science; Julia Moriarty, University of Colorado Boulder, Institute of Arctic and Alpine Research;; Joseph Carlin, Department of Geological Sciences, California State University, Fullerton

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Evaluating coastal restoration materials: plastics, bioplastics, and natural alternatives

Keywords: Living Shorelines;Marine Debris/Marine Plastic Pollution;Nature-Based Solutions;Oyster Reefs;RestorationSea Level Rise

Description: This session, designed for restoration practitioners and those interested in the science of coastal restoration, will explore: 1) the challenges associated with use of plastic materials in restoration (e.g., microplastics, nanoplastics), and 2) innovative alternatives such as cement-jute structures, basalt mesh, and BESE materials. It will also consider broader topics like bio-and photodegradation of microplastics, bioplastics, and the efficacy of novel materials under diverse coastal conditions (e.g., temperature, salinity, wave energy).

Conveners: Linda Walters, University of Central Florida; Zhanfei Liu, University of Texas at Austin Marine Science Institute; Emily Watts, University of Central Florida; Jennifer Beseres Pollack, Harte Research Institute, Texas A&M University-Corpus Christi

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Evaluation of artificial oyster reef substrates for habitat restoration

Keywords: Benthic Ecology;Ecosystem Services;Marshes;Oyster Reefs;RestorationSea Level Rise

Description: Natural oyster shell has become increasingly scarce and costly, leading to the use of artificial substrates for oyster (Crassostrea virginica) reef and salt marsh (Spartina alterniflora) habitat restoration. This session will highlight research related to the installation, monitoring, and evaluation of artificial oyster reef substrates for habitat restoration. We welcome work quantifying ecosystem services provided by artificial-substrate reefs, including habitat provision, shoreline stabilization, and water filtration to document the efficacy of these approaches as alternatives to natural oyster shell.

Investigations of relationships between site characteristics and material performance success are welcome. The session is relevant for ecologists and managers alike.

Conveners: Rochelle Seitz, Virginia Institute of Marine Science; Peter Kingsley-Smith, South Carolina Department of Natural Resources

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Evolution of estuarine and coastal ecosystems and biodiversity maintaining mechanisms

Keywords: Anthropogenic Impacts;Benthic Ecology;Biogeochemistry;Ecosystem-Based Management

Description: Estuaries and coasts are the key area in the Earth system for material and energy exchanges with complex multi-scale interactions. These regions have extremely high biodiversity and are essential for maintaining stability and health of coastal ecosystems. In the past century, driven by high-intensity human activities and climate change, the structure and function of estuarine and coastal ecosystems have undergone drastic changes, and the significant decline in biodiversity poses a serious threat to ecosystem health and sustainable development. This section mainly focuses on evolution processes, mechanisms of maintaining biodiversity and associated land-sea integrated plan to enhance biodiversity in these ecosystems.

Conveners: Lijun Hou, Lijhou Hou, East China Normal University; Zhanfei Liu, University of Texas at Austin Marine Science Institute; Zhenming Ge, State Key Laboratory of Estuarine and Coastal Research; Yanling Zheng, State Key Laboratory of Estuarine and Coastal Research

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Fish and shellfish: linking science, management, and society

Keywords: Conservation;Ecosystem-Based Management;Fish Ecology;Fisheries;Management

Description: This session aims to gather scientists and managers working on fish and shellfish ecology and fisheries to cover three topics:

SCIENCE- research that advances our understanding of the biology and ecology of estuarine and coastal fish and shellfish;

MANAGEMENT- how scientists, managers, and stakeholders have been working to improve fish and shellfish conservation and fisheries despite multiple anthropogenic pressures, including climate change;

SOCIETY- the importance of involving society in fisheries research and management, for example, through citizen science or participatory management programs, since fish and shellfish have a multicultural dimension spanning time and space.

Conveners: Pedro Morais, California Department of Water Resources; Ester Dias, CIIMAR - Interdisciplinary Centre of Marine and Environmental Research

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Freshwater inflow alteration effects on estuaries: from hydrology to ecology

Keywords: Estuarine and Coastal Modeling;Harmful Algal Blooms;Management;Oyster Reefs;Water Quality

Description: Estuaries are dynamic systems where fresh- and saltwater meet and mix. Excessive or reduced freshwater inputs can affect the water quality and ecology of receiving estuarine and coastal ecosystems. This session solicits presentations on projects that seek to understand the chronic and acute stressors to estuarine and coastal ecosystems and their fisheries of changes in freshwater input as a result of managed diversion of freshwater into or away from the system, or global climate change. We are particularly interested in projects intent to inform management solutions that mitigate negative effects of these changes.

Conveners: Kim de Mutsert, The University of Southern Mississippi; Aaron Ridall, The University of Southern Mississippi; Jessica Pruett, Mississippi Based RESTORE Act Center of Excellence

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From river to ocean: ecology-driven Everglades water management

Keywords: Anthropogenic Impacts;Environmental Flow;Hydrodynamics and Hydrology;Management;Monitoring

Description: The Greater Everglades (Florida, USA) watershed is a large system with diverse coastal habitat types that is at the forefront of large-scale restoration efforts. These habitats undergo similar challenges facing coastal regions worldwide. Water flows within and among connected habitats and is often facilitated through water management. Multiple ecological research programs exist to inform water management how to best meet desired ecological conditions while often considering socio-ecological needs resulting from habitat complexity. This session will highlight novel ecological knowledge across a variety of coastal Everglades habitats and demonstrate past, current, and future use to inform water management and restoration.

Conveners: Theresa Strazisar, South Florida Water Management District; Amanda McDonald, South Florida Water Management District; Melanie Parker, South Florida Water Management District

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Genetic variation, evolutionary approaches, and restoration: Bridging science and practice

Keywords: Climate Adaptation;Collaborative Research/Co-Production;Conservation;Genetics/Genomics;Molecular Ecology

Description: A growing body of work involving ecologists and evolutionary biologists is unravelling how genetic variation within key species can affect short and long-term population success and the recovery of ecosystem functions and services. Considering how these findings can be (and are being) incorporated into restoration practice is the goal of this session. The session is open to studies conducted in any coastal or estuarine systems that touch on areas such as ecological genomics, assisted gene flow, local adaptation, and others relevant to understanding how within-species variation can affect the success of restoration efforts.

Conveners: Randall Hughes, Northeastern University; Jay Stachowicz, University of California-Davis

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Habitat restoration on islands: unique challenges and opportunities.

Keywords: Anthropogenic Impacts;Diversity; Equity; Inclusion; and Accessibility;Island Ecology;Local Ecological Knowledge;Natural Disasters

Description: Efforts to design, permit, and implement coastal habitat restoration projects on islands are often challenged by a number of known and unknown variables. However, these challenges are met with the innovation needed for successful and meaningful restoration projects. In this session, we will learn about ecological science but also the economic, social and cultural considerations that impact decision-making, community support, project development, and implementation of coastal restoration on islands, with a focus on meaningful community engagement. In this session, we will also examine diverse restoration projects across U.S. islands and highlight lessons learned to inform future restoration efforts.

Conveners: Kemit-Amon Lewis, NOAA; Gabrielle Keeler-May, NOAA Fisheries; Olivia Saliger, NOAA Restoration Center

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Impacts of environmental change on marine fish

Keywords: Biogeochemistry;Climate Change;Fish Ecology;Fisheries;Trophic Biomarkers

Description: This session explores how climate-driven changes, such as temperature shifts, oxygen depletion, and pH variations, affect marine ecosystems, fish populations, and fisheries. Presentations highlight emerging techniques, including molecular, eDNA, and chemical analyses, to study fish responses to environmental changes, as well as analyses of historical archives, including preserved fish specimens and otoliths, to provide insights into past ocean variability. The session also addresses the impacts of these changes on fishing communities.

Conveners: Paulinus Chigbu, University of Maryland Eastern Shore; Steven Morey, Florida A&M University; Ali Ishaque, University of Maryland Eastern Shore; Richard Long, Florida A&M University

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Innovation to expedite effective beneficial use of dredge material projects.

Keywords: Ecological Modeling;Ecosystem-Based Management;Nature-Based Solutions;Policy

Description: There is a mismatch in the time it takes to complete a BU project and the desire for high-percentage utilization of available dredged material. BU projects require a sediment source, careful site selection, a positive cost-benefit, comprehensive planning, thorough environmental analysis, strong stakeholder engagement, and a collaborative approach with regulatory agencies to ensure the sediment can be safely reused and the site doesn't impact ecological or cultural considerations. This session will discuss opportunities for innovation in science and technical Guidance, Policy, Funding, and Regulation; and discuss project examples. We will conclude with a panel discussion about the future of BU.

Conveners: Trevor Meckley, NOAA; Jeffrey King, US Army Corps of Engineers; Laurel Reichold, U.S. Army Corps of Engineers; Douglas George, NOAA

Integrative Salt Marsh Ecology: Linking across scales and locations

Keywords: Marshes;Spatial Ecology;Watershed Ecology

Description: Understanding pattern and process between salt marshes is challenging due to the variety of climatic and coastal settings where they occur. Studies seeking to provide integrative assessments are further complicated by local differences in hypsometry, seascape position, and fragmentation. There is a critical need to account for these meso- and macro-ecological differences to understand salt marsh function. This session invites

researchers interested in making comparisons at any spatial scale to gain an enhanced understanding of the drivers of salt marsh ecosystems. Experimental, observational, and theoretical studies focused on flora, fauna, microbial, soil, biogeochemical, and ecosystem-level processes are all welcome.

Conveners: W. Ryan James, Florida International University; Scott Jones, University of North Florida; Erik Yando, Old Dominion University

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Living shorelines – adapting to changing coasts

Keywords: Ecosystem Services;Living Shorelines;Nature-Based Solutions;RestorationSea Level Rise;Socioecology

Description: Living shorelines are nature-based coastal protection techniques that can enhance the resilience of ecosystems and communities. Techniques vary depending on the physical exposure, morphology, environmental, and socio-cultural conditions of the coastal setting. Despite advances in the design and implementation of living shorelines to meet both ecological and protection goals, there remains a need for robust technical guidance that will support their broader use and acceptance. This session will address the sustainable application of living shoreline techniques across multiple scales and settings within changing systems and should be of interest to interdisciplinary researchers, coastal engineers, restoration practitioners and policy makers.

Conveners: Donna Marie Bilkovic, Virginia Institute of Marine Science; Rebecca Morris, University of Melbourne; Kelly Kibler, University of Central Florida; Ashley Rose, Virginia Institute of Marine Science, William & Mary

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Managing coastal wetlands as natural climate solutions

Keywords: Blue Carbon;Climate Change;Management;Nature-Based Solutions;RestorationSea Level Rise

Description: Coastal tidal wetlands can remove carbon from the atmosphere and store it in plant tissue and soil at the highest rates of any ecosystem. However, large areas of coastal wetlands have been degraded globally over the past several centuries, reducing their carbon sequestration capacity. This creates the opportunity for coastal wetland management to act as a natural climate solution (NCS), helping to mitigate climate change by having a net cooling benefit compared to pre-management conditions. This session invites presentations focused on any aspect of NCS, including biogeochemistry, ecology, social science, management techniques, and practical limitations.

Conveners: Charles Schutte, Rowan University; Scott Jones, University of North Florida

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Mangrove blue carbon: prioritizing climate change solutions for coastal communities

Keywords: Blue Carbon;Conservation;Mangrove Forests ;RestorationSea Level Rise;Wetlands

Description: This session calls for emerging patterns in mangrove and blue carbon science by addressing scientific or management strategies and methods, variability across diverse settings, and blue carbon discoveries across various scales. Topics may include efforts quantifying carbon or advances related to mangrove restoration or conservation. Project implementation and management efforts are proven to be most effective when scientific research centers community perspectives. This session aims to bring together both stories of scientific advances and community engagement, either combined or in separate talks, to emphasize how blue carbon science and opportunities for natural climate solutions are intrinsically connected to coastal communities.

Conveners: Zoë Shribman, Tulane University; Gabriela Reyes, University of Florida

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Marine Transportation Impacts to the Coastal Environment

Keywords: Hydrodynamics and Hydrology;Estuarine and Coastal Modeling;Nature-Based Solutions;Water Quality;Wetlands

Description: This session addresses the impacts of marine transportation on the coastal environment. Across the globe, navigation channel expansion to accommodate Post-Panamax vessels brings new challenges, including increased dredging, higher traffic density, and the impacts of larger and faster vessels on coastal ecology and shoreline erosion. This session will bring together scientists engaged in basic and applied research related to the hydrodynamics and environmental consequences of both commercial and recreational navigation in coastal and estuarine environments.

Conveners: Richard Styles, Coastal and Hydraulics Laboratory, Engineer Research and Development Center; Rachel Bain, Coastal and Hydraulics Laboratory, Engineer Research and Development Center; Douglas Krafft, Coastal and Hydraulics Laboratory, Engineer Research and Development Center

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Marshes for Maine's Future: the ways restoration should be

Keywords: Collaborative Research/Co-Production;Ecosystem Services;Marshes;Resilience;RestorationSea Level Rise

Description: Salt marshes in Maine may not be as iconic as the rocky coast, they are one of the most ecologically productive of Maine's coastal habitats. Sustainability of salt marshes is threatened by sea level rise, development, and erosion. A legacy of agricultural practices designed to "reclaim" tidal marshes for farming continues to threaten marsh sustainability by hindering the ability of marshes to keep up with increasing rates of sea level rise. This session highlights the work of organizations using innovative practices to restore hydrology, conserve pathways for marsh migration, protect critical habitat and build marsh resilience for ecosystem service provision.

Conveners: Chris Feurt, Wells NERR; Susan Adamowicz, US Fish and Wildlife Service/ Rachel Carson NWR; Tatia Bauer, Maine Coast Heritage Trust; Bonnie Turek, US Fish and Wildlife Service

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Microplastics in Coastal Ecosystems: Biological Interactions

Keywords: Emerging Contaminants;Microplastics;Monitoring;Organismal Biology

Description: Microplastics have been recognized as an emerging contaminant in aquatic systems for two decades, but the understanding of impacts and ecological effects on organisms remains poorly documented. This session will explore the latest research on biological interactions of microplastics in the coastal environment, on both organisms and the habitats they exploit.

Conveners: Bob Murphy, Tetra Tech; Christine Knauss, Tetra Tech; Meredith Seeley, Virginia Institute of Marine Science

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Microscopic to Mighty: Harnessing Microbial Ecology for Restoration Success

Keywords: Climate Adaptation;Microbial Ecology;Population/Community Ecology;Resilience;Soil Ecology

Description: Microbes play a crucial yet often overlooked role in coastal ecosystem function and resilience. This session explores cutting-edge research on microbial contributions to coastal restoration, focusing on plant-microbe interactions, microbial community assembly, and functional resilience. Join us to discuss the potential of microbial innovation in restoration science, current knowledge gaps, and pathways to integrate microbial insights into policy and large-scale ecosystem management.

Conveners: Kylea Garces, Northeastern University; Ashley Bulseco, University of New Hampshire

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Mixing and Transport in Estuaries and Coastal Systems Mixing and Transport

Keywords: Coastal Engineering;Hydrodynamics and Hydrology;Estuarine and Coastal Modeling;Physical Oceanography;Resilience

Description: This session seeks to enhance our understanding of mixing and physical transport processes in estuaries and the coastal ocean, utilizing both observational data and numerical modeling approaches. We invite studies that explore the mechanisms driving mixing and physical transport in various coastal systems. Topics of interest for this session include but are not limited to: a) circulation patterns from both Eulerian and Lagrangian perspectives; b) subtidal exchange and material fluxes; c) interactions among circulation, stratification, and mixing; and d) the impact of bathymetric features or modifications and/or physical structures on system dynamics.

Conveners: Meng Xia, University of Maryland Eastern Shore; Brian Dzwonkowski, University of South Alabama; Yonggang Liu, College of Marine Science, University of South Florida; David Ralston, Woods Hole Oceanographic Institution

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Monitoring and Modeling Estuarine Lower Trophic Levels

Keywords: Benthic Ecology;Ecological Modeling;Food Web Ecology;Plankton Ecology;RestorationSea Level Rise

Description: Lower trophic levels in estuaries include phytoplankton and zooplankton in the water column and microphytobenthos and macrofauna associated with the sediments. These lower trophic levels form the base of the estuarine food web and are often the first to respond to changes in environmental conditions. Therefore, comprehensive ecological monitoring and modeling efforts are ongoing and under development to document shifting baselines and predict future trends of energy cycling within estuarine food webs.

Conveners: Melissa Baustian, U.S. Geological Survey; Bingqing Liu, University of Louisiana Lafayette; Erin Kiskaddon, The Water Institute of the Gulf; Megan La Peyre, U.S. Geological Survey, Louisiana Fish and Wildlife CRU/LSU AgCenter

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Monitoring and Modeling Estuarine Nekton

Keywords: Ecological Modeling;Food Web Ecology;Monitoring;Nekton;RestorationSea Level Rise

Description: Estuarine nekton species, including fishes, shrimps, and crabs, convert lower trophic level productivity into biomass that directly and indirectly support megafauna (e.g., dolphins and wading birds) and valuable fisheries. Large-scale stressors are changing

coastal wetland extent, food webs, and productivity, presenting challenges for sustaining current amounts of estuarine productivity. This session will cover how traditional and modern monitoring approaches support assessment of habitat quality, quantity, and restoration effectiveness and contribute additional detail to improve ecosystem modeling. This session is timely given the transition towards Ecosystem Based (Fisheries) Management and as considerable investments in habitat restoration are being implemented.

Conveners: Ian Zink, NOAA NMFS OHC RC DWH Program; David Reeves, NOAA NMFS OHC RC DWH Program; Bruce Vogt, National Oceanic and Atmospheric Administration; Theresa Davenport, LSU AgCenter

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Moving Restoration Science Forward Through Interagency Coordination, Co-Production, and Cooperation

Keywords: Collaborative Research/Co-Production;Nature-Based Solutions;RestorationSea Level Rise;Seagrasses and Other Submerged Aquatic Vegetation;Urban Coastal and Estuarine Ecosystems

Description: Habitat restoration in coastal and estuarine systems demands a multifaceted approach uniting science, management, and community. This session highlights how interagency coordination, NOAA's co-production framework, and strategic partnerships drive resilient and sustainable outcomes. Submissions should showcase success stories, innovative solutions, and lessons learned that decrease stressors, restore habitats, and enhance resilience. We invite researchers, managers, and community leaders to share their experiences, emphasizing interdisciplinary collaboration, participatory science, and transdisciplinary approaches to advance restoration science and coastal resilience.

Conveners: Jessy Wayles, IRLNEP; Rachel Brewton, Harbor Branch Oceanographic Institute at Florida Atlantic University; Lorae Simpson, St. Johns River Water Management District

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Mud to multispectral: evaluating coastal disturbances to capture landscape variability

Keywords: Data Analysis; Data Mining; and Visualization;Estuarine and Coastal Modeling;Mapping ;Remote Sensing;Spatial Ecology

Description: Coastal disturbances such as wrack disturbance, ice scouring, dieback, or herbivory all occur at various scales. Understanding how ecosystems respond across scales is important for evaluating resilience and recovery. Integrating observations from plots and remotely sensed data can allow responses to disturbance across landscapes to be better elucidated. This session welcomes talks that evaluate multiscale disturbance,

including field or remotely sensed data from plots to landscape scales. This session should be of interest to coastal resource managers and researchers who seek to understand how disturbance may inform regional decision making.

Conveners: Tyler Lynn, Department of Geography, University of Georgia; Matt Pierce, Odum School of Ecology, University of Georgia; Jessica O'Connell, Department of Ecosystem Science and Sustainability, Colorado State University; Anna Armitage, Texas A&M University at Galveston

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Mud, macrofauna and microbes: An Ode to Benthos VI

Keywords: Benthic Ecology;Biogeochemistry;Food Web Ecology;Geology;Microbial Ecology

Description: Featuring explorations of benthic interactions across various scales through novel and interdisciplinary research, this session should be of interest to scientists from physical, chemical, biological, and computational disciplines. This 6th Ode to Benthos installment celebrates all that is muddy and encourages presentations that incorporate rhyme, stanza, or musical accompaniment. By way of inspiration:

Whether you study microbes, mussels, worms

Or the physical like sediment bedforms,

This session is a celebration

Of benthic functions, like bioturbation

Fresh, brackish, aquamarine

As long as mud is your scene

Ecologists, geologists and biogeochemists too,

We really want to hear from you!

Conveners: Leila Hamdan, University of Southern Mississippi; Janet Nestlerode, US EPA - ORD; Treda Grayson, USEPA; Elizabeth Hinchey, EPA

Natural History of Coastal Delmarva Peninsula: Integrating research and monitoring

Keywords: Aquaculture;Local Ecological Knowledge;Marshes;Monitoring;Population/Community Ecology

Description: The Delmarva Peninsula seaside is comprised of barrier islands, extensive salt marshes, tidal creeks, and coastal bays along 110 miles of wilderness. Habitats are ecologically unique and varied with a general lack of local anthropogenic disturbance, which decreases southward. Ocean salinity dominates due to freshwater input from relatively short watersheds. Geologic processes range from relatively stable to highly dynamic. The upper portion of this region has higher potential nutrient inputs, whereas the lower portion is a carbon rich, low nutrient ecosystem. This session integrates both short- and long-term interdisciplinary views of these varied and unique systems.

Conveners: Stacy Krueger-Hadfield, Virginia Institute of Marine Science Eastern Shore Laboratory; Paige Ross, VIMS Eastern Shore Laboratory; Richard Snyder, VIMS Eastern Shore Laboratory

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Natural infrastructure: supporting natural and cultural resilience in estuarine environments

Keywords: Climate Adaptation;Ecosystem-Based Management;Marshes;Nature-Based Solutions;Resilience

Description: Preserving the natural character of estuaries and supporting public use of these ecosystems are not opposing concepts, as humans have relied on these areas for food, recreation, spiritual connection, and other needs throughout history. However, as climate change and developmental pressures continue to adversely impact estuaries, the continued use of traditional measures to provide access and coastal protection often result in loss of the very resources meant to be protected. We invite presentations focused on the use of natural infrastructure to enhance the resilience of estuarine ecosystems while also supporting their continued value as important cultural resources.

Conveners: Cathy Johnson, National Park Service; Marantha Dawkins, University of Virginia; Jamie Kilgo, National Park Service

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New Developments in Coastal Blue Carbon Science for Management

Keywords: Blue Carbon;Management;Nature-Based Solutions;Remote Sensing;RestorationSea Level Rise

Description: This session highlights the ongoing efforts of NOAA and cross-sector partnerships to advance the understanding of coastal blue carbon habitats, including seagrasses, salt marshes, and mangroves, for carbon storage, climate resilience, and

biodiversity conservation. Topics will include the benefits these ecosystems provide through the capture and storage of carbon dioxide, the integration of blue carbon into marine sanctuary management, satellite remote sensing applications, international partnerships, coastal blue carbon resources, and project updates under recent U.S. climate legislation. The session explores the opportunities and challenges in preserving and restoring these vital ecosystems to combat climate change and support coastal resilience.

Conveners: Rebecca Trinh, NOAA; Douglas George, NOAA; Janine Harris, NOAA Restoration Center; Molly Bost, NOAA

Non-indigenous and invasive species in estuaries and coasts

Keywords: Biological Invasions/Invasive Species;Citizen Science;Education and Outreach;Management

Description: Invasive species are known for their detrimental impact on ecosystems. The cryptic introduction of non-indigenous species (NIS) often forces scientists and managers to respond to a serious ecological problem when management actions can only prevent the spread of an invasive species or mitigate its impact. Therefore, this session aims to gather contributions showcasing how scientists and managers develop techniques and strategies to become better prepared to detect NIS, know their overarching impacts, and implement more effective management solutions.

Conveners: Pedro Morais, California Department of Water Resources; Hiu Ting Ko

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Nutrients and HAB interactions: comparing imported and in situ phenomena

Keywords: Eutrophication;Harmful Algal Blooms;Nutrient Cycling;Spatial Ecology;Water Quality

Description: Harmful algal blooms (HABs) have increasingly widespread and negative impacts on estuaries worldwide, with nutrients being recognized as a primary driver of these blooms. HAB events can be advected from riverine or oceanic waters into estuaries or initiated in estuaries. In each of these cases, relationships between nutrients, HAB dynamics, and HAB impacts can differ.

The goal of this session is to compare and contrast the interplay of nutrients and HABs in estuaries from advected and in situ blooms. The results of this exploration will have broad implications, including how best to manage nutrients to reduce estuarine HABs.

Conveners: Galen Kaufman, US Environmental Protection Agency; Michael Paul, USEPA; Brenna Friday, US Environmental Protection Agency; Marc Suddleson, National Oceanic and Atmospheric Administration

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Plankton in changing estuarine and coastal environments

Keywords: Harmful Algal Blooms;Phytoplankton;Plankton Ecology;Water Quality;Zooplankton

Description: Estuarine and coastal environments are experiencing a diverse array of long-term changes and given that plankton have high growth rates and short generation times, they are often the first organisms to respond to environmental shifts. Changes among the plankton often cascade throughout the rest of the ecosystem, which makes studying plankton responses to shifting environments imperative. We encourage submissions that examine how environmental changes are impacting plankton, in situ, in vitro, or in silico, for all types of plankton (bacterio- to ichthyo-). We especially encourage research on how plankton simultaneously respond to multiple stressors.

Conveners: Nicole Millette, James Pierson, Patricia Thibodeau

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Positive social and ecological interactions in restoration
Keywords: Population/Community Ecology;Resilience;RestorationSea Level Rise;Socioecology

Description: Ecosystem restoration is an action-forward approach to conservation in the face of ecosystem loss. For restoration to reach its full potential, however, will require novel methodologies that account for the social-ecological context in which restoration occurs. Positive interactions, both ecological and social, have the potential to improve restoration success. This symposium will highlight research that tests novel methodologies and approaches that harness positive interactions (e.g., cooperation between species and/or people) to improve coastal and estuarine restoration outcomes.
Conveners: Stephanie Valdez, University of Washington; Carter Smith, Duke University; Y. Stacy Zhang, North Carolina State University; Rachel Gittman, East Carolina University

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Promising partnerships: interdisciplinary approaches to coastal and estuarine science

Keywords: Collaborative Research/Co-Production;Conservation;Management;RestorationSea Level Rise;Transdisciplinary Research

Description: This session highlights the role of interdisciplinary research in addressing complex challenges facing coastal and estuarine systems. Though transdisciplinary approaches are essential for tackling local issues (e.g., coastal and community resilience) and global challenges (e.g., climate change), they often fall short without strong interdisciplinary partnerships. Successful collaborations require a commitment to real-world problems, identification of common ground, and integration of processes and goals. This session will explore how such partnerships can produce applied solutions for sustainable management of coastal and estuarine ecosystems. We invite contributions that showcase innovative methodologies, case studies, and frameworks focused on advancing holistic, interdisciplinary solutions.

Conveners: Jennifer Beseres Pollack, Harte Research Institute, Texas A&M University-Corpus Christi; Shannon Fitzsimmons-Doolan, Texas A&M University - Corpus Christi; Peter Schuhmann, University of North Carolina - Wilmington; Steven Scyphers, University of South Alabama; Caitlin Young, NOAA RESTORE Science Program

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Resilient estuaries and communities: bridging knowledge systems and co-designing solutions

Keywords: Collaborative Research/Co-Production;Integrated Ecosystem Assessment;Resilience;Socioecology;Transdisciplinary Research

Description: Enhancing the resilience and sustainability of estuarine systems and coastal communities requires innovative and transdisciplinary approaches that integrate diverse knowledge systems and facilitate inclusivity in co-designing solutions. By bridging natural and social sciences, governance, and community perspectives, this session aims to explore actionable pathways for achieving resilience, sustainability, and equity in estuarine regions globally through transdisciplinary approaches and co-production of knowledge. Presentations will highlight innovations in integrating and assessing complex socio-environmental systems and traditional ecological knowledge, inclusive community engagement, and effective co-design and communication of management strategies to address the challenges of global change, coastal resilience, equitable sustainability, and adaptive environmental governance.

Conveners: Vanessa Vargas-Nguyen, UMCES; Lili Badri

Restoration monitoring data in action: informing design and adaptive management

Keywords: Monitoring;Nature-Based Solutions;Resilience;RestorationSea Level Rise

Description: Physical, chemical and biological monitoring are vital for successful coastal habitat restoration or enhancement projects. However, monitoring data from these

projects often reach a limited audience of project funders or permit authorities. Analysis and application of restoration monitoring data can be used to advance restoration design by improving on-the-ground projects. In this session we will highlight practical application of monitoring data to guide and inspire more widespread use of this data as a valuable tool for improving outcomes.

Conveners: Erin Reilly, Chesapeake Bay National Estuarine Research Reserve - VA; Rebecca Swerida, Maryland Department of Natural Resources; LeeAnn Haaf, Partnership for the Delaware Estuary; Shelby Johnson, Maryland Department of Natural Resources

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Restoring Balance: Management and Restoration's Role in Coastal Nitrogen Cycling

Keywords: Anthropogenic Impacts;Biogeochemistry;Ecosystem Services;Management;Nutrient Cycling

Description: Nitrogen cycling in coastal environments is a critical process that underpins ecosystem health. While agriculture, urbanization, and industrialization have increased nitrogen inputs, management and restoration activities offer opportunities to mitigate these impacts and restore ecosystem function. This session will convene scientists, managers, and policymakers to explore how management and restoration activities influence nitrogen cycling in coastal environments. Topics include how wetland restoration and nutrient management impact nitrogen cycling, and how interventions like coastal restoration can offset/reduce nutrients. By highlighting innovative research and real-world case studies, the session aims to foster cross-disciplinary dialogue and identify pathways toward better coastal ecosystem management.

Conveners: Ariella Chelsky, San Francisco Estuary Insitute; Hillary Sullivan, Woods Hole Research Center/Northeastern University; Ben Gilby, University of the Sunshine Coast

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Restoring Fish Habitat with Traditional and Local Ecological Knowledge

Keywords: Fisheries;Indigenous Knowledge;Local Ecological Knowledge;RestorationSea Level Rise;Traditional Ecological Knowledge

Description: This session will focus on presentations and discussion grounded/based in traditional and local ecological knowledge that guided the development, design, prioritization and implementation of restoration projects that enhance fisheries habitat including opening stream miles for fish passage. Presentation topics will be prioritized that describe and explore meaningful engagement of Indigenous communities, underserved communities, and agricultural/aquacultural communities in the context, planning and implementation of coastal restoration projects that benefit fish throughout the United States and U.S. Affiliated Islands.

Conveners: Janine Harris, NOAA Restoration Center; Olivia Saliger, NOAA Restoration Center; Gabrielle Keeler-May, NOAA Fisheries

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Reviving West Bay: Seagrass Habitat Restoration for Healthier Costal Ecosystems

Keywords: Ecosystem Services;Resilience;Seagrasses and Other Submerged Aquatic Vegetation

Description: The western shoreline of St Andrew's Bay has been documented to have lost at least 200 acres of seagrass habitat within a relatively short period of time in recent history. This seagrass transplant effort was one of multiple efforts focused on seagrass habitat along the western shorelines. AquaTech successfully planted six acres of Halodule wrightii (H. wrightii) within a carefully planned restoration area, established and monitored by FWC, using novel tools paired with established seagrass transplantation methods.

Conveners: Nikki Jackson, AquaTech Eco Consultants; Josh Menendez, AquaTech Eco Consultants; Beau Williams, AquaTech Eco Consultants

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Rooted Resilience: Mangroves, Communities, and Coastal Renewal
Keywords: Citizen Science;Collaborative Research/Co-Production;Mangrove Forests ;Resilience;RestorationSea Level Rise

Description: Communities are increasingly recognizing the value of mangroves and contributing to their restoration and management in innovative ways. By connecting global expertise and local wisdom, we aim to highlight how mangroves are not only critical to ecosystem health but also to the resilience and well-being of coastal communities. This session seeks abstracts that highlight diverse aspects of mangrove work, including but not limited to: stressors and disturbances, restoration and management, community impacts and collaboration, and success stories and lessons learned. We invite submissions from researchers, practitioners, educators, policymakers, and community leaders engaged in advancing knowledge and action around mangroves.
Conveners: Allie Durdall, University of the Virgin Islands-CMES; Kristin Wilson Grimes, University of the Virgin Islands; Anna Armitage, Texas A&M University at Galveston; Danielle Ogurcak, Florida International University

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Sea Grant-funded innovative technologies in marine debris

Keywords: Anthropogenic Impacts;Marine Debris/Marine Plastic Pollution;Microplastics;Pollution;Remote Sensing

Description: This session highlights six projects funded by the National Sea Grant Office as part of the 2024 Marine Debris Challenge competition. These highlighted projects are developing innovative uses of novel technologies to prevent and remove marine debris, with an emphasis on remote sensing, artificial intelligence, robotics, and machine learning. All projects include public engagement and community outreach components in order to advance environmental literacy in this critical topic.

Conveners: Madison Willert, National Sea Grant Office, NOAA

Sea-level rise and the transgression of coastal landscapes

Keywords: Anthropogenic Impacts;Coastal Forests;RestorationSea Level Rise;Wetlands;Other

Description: This "transgression session" will present the latest findings from a variety of scientific disciplines and approaches about the drivers of landward migration of the coastal landscape. The session will explore physical, ecological, and anthropogenic factors that control the outcomes of coastal transgression.

Conveners: Justus Jobe, Virginia Institute of Marine Science, William & Mary; Matthew Kirwan, Virginia Institute of Marine Science, William & Mary; Keryn Gedan, George Washington University

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Seascape-faunal connections: impacts of seascape heterogeneity on faunal processes

Keywords: Animal Behavior;Fish Ecology;Population/Community Ecology;Seagrasses and Other Submerged Aquatic Vegetation;Other

Description: Heterogeneity across space drives critical processes affecting faunal distribution, interactions, and movement. A powerful tool to investigate such connections is combining the relatively new field of seascape ecology with disciplines focused on animal processes such as community ecology, food web ecology, and movement ecology. To understand how the combination of seascape and faunal ecology is being used to understand functioning within coastal ecosystems, our session will focus on current research into how habitat composition and configuration impact community structure, food webs, and animal movement in coastal ecosystems impacted by anthropogenic disturbances and global change.

Conveners: Jonathan Rodemann, Florida International University; Rolando Santos, Florida International University; Gina Badlowski, Florida International University; Marianna Coppola, Florida International University

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Sediment Dynamics and Management in Back-Barrier and Estuarine Environments

Keywords: Coastal Engineering;Geology;Marshes;Resilience;Sediment Accumulation/Accretion

Description: Backbarrier and estuarine environments, particularly salt marshes, provide myriad benefits but are under threat from natural processes and anthropogenic activities. The details of the physical and geologic drivers of sediment erosion, transport and accretion are poorly known but critical for the long-term resilience of these environments. Future marsh loss from rising sea levels and decreasing sediment inputs highlight the need for beneficial use of existing sediment resources. Regional Sediment Management (RSM) encourages this use for marsh restoration to build elevation capital, counteracting relative sea-level rise and decreases in sediment input, and creation of coastal avian habitat.

Conveners: Clark Alexander, UGA-Skidaway Institute of Oceanography; Katie Luciano, South Carolina Geological Survey; Ashley Long, Bureau of Ocean Energy Management

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Solving management questions with remote sensing data and tools

Keywords: Conservation;Management;Mapping ;Remote Sensing;Transdisciplinary Research

Description: Remote sensing has revolutionized our ability to collect data in the coastal environment. This session seeks to convene researchers and managers who use various remote sensing data to inform coastal management decisions, enhance ecosystem and community resiliency, and to better understand current and anticipated changes to coastal ecosystems. This session should be of interest to researchers who utilize remote sensing data to better understand coastal processes, to natural resource managers who use remote sensing-based information to make critical decisions, and to coastal stakeholders who seek to better understand the state and availability of remote sensing products, tools, and data.

Conveners: Kari St.Laurent, NOAA/NOS/NCCOS; Tyler Lynn, Department of Geography, University of Georgia; Caroline Owens, CSS, Inc.

Stewarding the commons: agency coordination to address estuarine acidification

Keywords: Collaborative Research/Co-Production;Ocean and Coastal Acidification;Urban Coastal and Estuarine Ecosystems

Description: Multiple federal agencies are charged with monitoring estuary health and providing decision-relevant information to many audiences. This requires deliberate coordination and inclusion of multiple perspectives. This session seeks to advance understanding about how agencies, especially federal scientific agencies, can collaborate better and advance estuarine acidification science in ways that increasingly support holistic decisionmaking. The session will include multiple short presentations and discussion. Target audiences include: estuarine acidification researchers; state, Tribal, and other policy makers; nonprofit organizations; and resource managers. Early career professionals may find inspiration in the session's focus on scientific gap assessment and improving the science-to-decision support pathway.

Conveners: Sarah Cooley, NOAA; Dwight Gledhill, NOAA Ocean Acidification Program; Cheryl Brown, US EPA, Office of Research and Development

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Stories from the Braided River II

Keywords: Diversity; Equity; Inclusion; and Accessibility;Education and Outreach;Other

Description: This session returns to CERF to offer opportunities to share the diverse and nonlinear ways we have come to our work. This builds on the metaphor proposed by Batchelor et al. (2021) of a braided river to describe career trajectories into science. They write that the braided river "looks less like a structured pipeline and more like a collection of paths that change and adapt to the needs of the individual". We welcome stories from contributors who can share the experience of their own braided river pathway into belonging and purpose in the coastal science and management community.

Conveners: Lora Harris, University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory

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Strategies for interpreting long-term monitoring data to assess ecosystem stability

Keywords: Climate Change;Monitoring;Resilience

Description: Extreme climate events, anthropogenic stressors, and ecological feedbacks can alter the state and stability of coastal ecosystems. Thus, understanding resilience and resistance of these systems will provide insights to how coastal ecosystems will respond to future change, especially in the context of changing disturbance regimes. Long-term ecological monitoring data are essential for informing scientifically sound management strategy and restoration efforts in coastal ecosystems. This session invites empirical, theoretical, and application-based contributions investigating resilience, resistance, and temporal stability of coastal ecosystem structure and function. We especially encourage

contributions using innovative statistical methods, unique datasets, and/or multiple spatiotemporal scales.

Conveners: W. Ryan James, Florida International University; Rolando Santos, Florida International University; Marianna Coppola, Florida International University; Bradley Furman, Florida Fish Wildlife Conservation Commission

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The Next Wave: NOAA Scholars Advancing Innovative Coastal Science

Keywords: Climate Adaptation;Collaborative Research/Co-Production;Education and Outreach;Environmental Justice;Marine Debris/Marine Plastic Pollution

Description: This session will showcase the contributions of NOAA's Educational Partnership with Minority Serving Institutions and Ernest F. Hollings Undergraduate Scholarship programs addressing critical environmental challenges while enhancing America's global competitiveness in the sciences. These programs aim to train a NOAA-aligned workforce while advancing research in atmospheric, oceanic, and environmental sciences and remote sensing technology. The session will spotlight research tackling pressing environmental issues and highlight the unique perspectives and innovative approaches scholars bring to addressing coastal, oceanic and atmospheric issues. Attendees will learn how scholars are collaborating with NOAA scientists and mentors to deliver actionable science and meaningful community impacts.

Conveners: Amara Davis, NOAA Office of Education; Erianna Hammond, NOAA Office of Education

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Tidelands: a landscape approach to natural infrastructure innovation

Keywords: Climate Adaptation;Collaborative Research/Co-Production;Estuarine and Coastal Modeling;Nature-Based Solutions;Transdisciplinary Research

Description: Compared to traditional coastal infrastructure, natural infrastructure offers superior adaptive capacity, greater resilience, broader societal and ecological benefits, and often reduced costs compared to conventional structural measures. Realizing this value, however, requires innovation, particularly to address the diversity and uniqueness of the country's estuaries. "Tidelands" is a five-year research project that aims to produce environment-specific, performance-assessed natural infrastructure design concepts in partnership with organizations and communities on the Atlantic and Gulf Coasts. Take a deep dive into the process of developing natural infrastructure for a range of bays and estuaries through cross-disciplinary collaboration, experimental methodologies, and a landscape architecture-based approach.

Conveners: Adrian Robins, University of Virginia; Brian Davis, University of Virginia; Sean Burkholder, University of Pennsylvania; Rob Holmes, Auburn University

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Tradition meets innovation: Transforming shellfish aquaculture and harvesting

Keywords: Aquaculture;Collaborative Research/Co-Production;Local Ecological Knowledge;Management;Traditional Ecological Knowledge

Description: This session explores how traditional and local ecological knowledge (TEK/LEK), academic research, and modern technologies are shaping the future of shellfish aquaculture and harvesting. Talks will highlight how historical practices, innovative tools, and collaboration address ecological, social, and industry challenges in coastal ecosystems.

Conveners: Kinsey Tedford, Oyster Recovery Partnership; Jennifer Walters, Oyster Recovery Partnership; Jessica Pruett, Mississippi Based RESTORE Act Center of Excellence

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Tradition with transition: Human-modified systems effects on ecosystem function

Keywords: Climate Change;Coastal Engineering;Ecosystem Services;Resilience;Urban Coastal and Estuarine Ecosystems

Description: From spoil islands to shell middens, our coastlines have been modified as long as humans have lived on the coast. Yet, we lack a complete understanding of how these changes have impacted ecosystem function and resilience. This session is geared towards studies of human-modified systems and their impact on coastal ecosystem function and resilience. Our goal is to move towards the incorporation of human and natural elements in projects to better understand the resilience of coastal environments.

Conveners: Anna Braswell, University of Florida; Corianne Tatariw, Rowan University - Department of Environmental Science

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Understanding coastal ecosystem structure and function through food web interactions

Keywords: Energy;Food Web Ecology;Resilience;Spatial Ecology;Trophic Biomarkers

Description: Understanding food web interactions in coastal ecosystems provides insight into community structure, energy flow, and resilience. Tools like trophic biomarkers,

remote sensing, and telemetry help quantify complex trophic relationships across spatial and temporal scales. This session invites researchers to share insights on conservation, restoration, and ecosystem responses to environmental change. Presentations will focus on translating findings into strategies for enhancing food web resilience and mitigating human and climate impacts, offering value to ecologists, resource managers, and conservation practitioners.

Conveners: Justin Lesser, Florida International Univeristy; Shelby Ziegler, University of Georgia; Steven Litvin, Monterey Bay Aquarium Research Insitute; Herbert Leavitt, University of Georgia

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Understanding coastal squeeze: migration of coastal wetlands with sea level rise

Keywords: Geomorphology;Mapping ;RestorationSea Level Rise;Transdisciplinary Research;Wetlands

Description: The future sustainability of coastal zones will depend on the ability of both human and natural systems to move landward as sea level rise accelerates. However, accommodation space for inland/upslope migration of coastal wetlands is decreasing due to development pressures, resulting in “coastal squeeze”. Understanding the socio-ecological factors influencing responses to coastal flooding and the role of wetlands is crucial for developing effective adaptation strategies and promoting coastal resilience.

Conveners: Patrick Biber, The University of Southern Mississippi; Anamaria Bukvic, Virginia Tech, Department of Geography; Thomas Allen, Old Dominion University, Political Science & Geography; Yin-Hsuen Chen, Old Dominion University, Center for Geospatial Science, Education, and Analytics

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Urban Restoration

Keywords: Living Shorelines;Marshes;Oyster Reefs;Urban Coastal and Estuarine Ecosystems;Water Quality

Description: Shoreline and subtidal restoration of key marine/ estuarine habitats is of great importance along our coasts. However, in urbanized habitats these restoration projects proceed differently than in more pristine or rural areas. In this session, we will discuss restoration projets in highly urbanized subtidal and coastal habitats, and learn how these projects may differe in terms of timelines, funding, and scientific outcomes. This session should be of interest to restoration practicioners, outreach and education professionals, regulatory agencies, and environmental policy/ legislation advocates. Urban spaces are a key piece in global ecology, and serve to connect the public to the water.

Conveners: Allison Fitzgerald, New Jersey City University

Water-quality patterns and trends I: Innovative monitoring techniques

Keywords: Management;Remote Sensing;Water Quality

Description: Restoring complex aquatic ecosystems requires sustained collaboration between science and resource management communities. Key to these efforts are innovative monitoring techniques that provide critical feedback on restoration progress and guide adaptive management. Systematic water quality monitoring, integrating traditional methods and emerging technologies, supports understanding ecosystem dynamics. This session welcomes research on novel monitoring methods, satellite integration, cutting-edge technologies, and living resource considerations in coastal and inland waters. This is Part I of two connected sessions on "water-quality patterns and trends."

Conveners: Kaylyn Gootman, U.S. Environmental Protection Agency, Chesapeake Bay Program Office; Breck Sullivan, USGS/CBP; Qian Zhang, University of Maryland Center for Environmental Science / USEPA Chesapeake Bay Program; Peter Tango, U.S. Geological Survey / Chesapeake Bay Program

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Water-quality patterns and trends II: Novel analysis and communication approaches

Keywords: Data Analysis; Data Mining; and Visualization;Estuarine and Coastal Modeling;Management;Water Quality

Description: Restoration of aquatic ecosystems requires innovative analysis and communication efforts from science and resource management communities. This session focuses on water-quality patterns and trends along the land-river-estuary continuum, highlighting empirical and mechanistic approaches that integrate data and models to understand responses to drivers such as land-use changes and management actions. We invite contributions showcasing advanced statistical and machine learning methods, mechanistic models, and science communication (including data visualization) tools that translate findings into actionable solutions for managers. This is Part II of two connected sessions on "water-quality patterns and trends."

Conveners: Qian Zhang, University of Maryland Center for Environmental Science / USEPA Chesapeake Bay Program; Rebecca Murphy, University of Maryland Center for Environmental Science / USEPA Chesapeake Bay Program; James Webber, U.S. Geological Survey; Natalie Nelson, North Carolina State University

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Watershed Science and Modeling for Coastal and Estuarine Resilience

Keywords: Conservation;Hydrodynamics and Hydrology;Resilience;Water Quality;Watershed Ecology

Description: This session explores the role of watershed science and modeling in addressing the challenges facing coastal and estuarine systems. Presentations will focus on advancements in research and modeling techniques that address critical issues such as nutrient loading, pollution, stream community condition, habitat degradation, and climate-driven impacts. The session will highlight research identifying and assessing innovative tools and solutions to identify physical, chemical, and biological stressors, restore habitats, and enhance coastal and estuarine resilience. Emphasizing transdisciplinary collaboration, the session showcases participatory science programs, and the co-production of knowledge with communities and stakeholders to bridge gaps between science, management, and action.

Conveners: Joseph Delesantro, ORISE, EPA, Chesapeake Bay Program Office; Lewis Linker, U.S. EPA Chesapeake Bay Program Office; Daniel Obenour, NCSU Department of Civil, Construction, and Environmental Engineering; John Young, USGS Eastern Ecological Science Center

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