

Effective Approaches for Monitoring and Assessing Gulf of Mexico Restoration Activities

Committee

Frank W. Davis

Chair

Dr. Davis is Director of the National Center for Ecological Analysis and Synthesis and Professor of Landscape Ecology and Conservation Planning at the Bren School of Environmental Science and Management, University of California, Santa Barbara. He brings conservation science and geographical analysis to bear in land use planning and the conservation of wild species. Dr. Davis heads the Biogeography Lab at the Bren School, and his research focuses on the landscape ecology of California plant communities, the design of protected-area networks, rangeland and farmland conservation, and the biological implications of regional climate change. He has received several honors and awards including the Aldo Leopold Leadership Fellow and Fellow of the American Association for the Advancement of Science. Dr. Davis has previously chaired the National Research Council Committee on Independent Scientific Review of Everglades Restoration Progress and served as a member on numerous NRC committees. He received a PhD in Geography and Environmental Engineering from The Johns Hopkins University, and a BA in Biology from Williams College.

David M. Burdick

Member

Dr. Burdick is the Interim Director of the Jackson Estuarine Laboratory and Research Associate Professor of Coastal Ecology and Restoration in the Department of Natural Resources and the Environment, University of New Hampshire. His research focuses on ecology and management of coastal wetlands, and design, implementation and assessment of habitat restoration. Dr. Burdick places emphasis on understanding how tidal wetlands play invaluable roles in supporting marine ecosystems and coastal populations. He is interested in the functions of tidal habitats, how plants respond to stresses (flooding, salinity, pollution, disease, invasive species, and human alterations), and how plants interact with physical processes to maintain these habitats. Dr. Burdick received his PhD in Marine Sciences from Louisiana State University and a BS in Chemistry from Hobart College.

Loren Coen

Member

Dr. Coen is an Affiliate Research Professor and Scientist in the Department of Biological Sciences and Harbor Branch Oceanographic Institute, at Florida Atlantic University (FAU). Dr. Coen has worked for over 30 years on the eastern seaboard of the U.S., in the Gulf of Mexico, and Caribbean Sea on marine and estuarine ecosystems and their associated habitats (marshes, SAV, mangroves, and oyster reefs). He is a marine ecologist with a broad range of expertise in marine ecology (especially on bivalves) and related restoration. His recent research includes studies on oyster reef ecology, related habitat mapping and restoration. Past research includes seagrass-bivalve interactions in the Gulf of Mexico, coral reef ecology in Belize focusing on plant-animal interactions, restoration ecology including sampling of oyster reef habitats, work on the ecological value of estuarine habitats as nurseries for various species including parallels of shellfish aquaculture with natural systems, assessing non-native species 'introductions' in U.S. waters, and large-scale habitat mapping efforts directing teams with diverse backgrounds. In 2011, he served on an IUCN (International Union for Conservation of Nature) workshop to assess the conservation status of the world's habitat-forming bivalves for inclusion on the IUCN Red List of Threatened Species. Its primary goal was to bring together regional and international scientific experts to assess the global extinction risk of individual species of the Ostreidae and Mytilidae families. This work marked the initial appearance of these important marine species on the Red List. He also organized one of the first restoration workshops (and a dedicated website) as part of the effort to develop standardized methods and related goals and success criteria for restoration efforts with a focus on ecosystem services, and has been involved on the steering committee with nearly all of the ICSR (International Conference on Shellfish Restoration) conferences since its inception in 1996. He coauthored recent studies on the status of shellfish habitats across the U.S. and globally and a handbook related to assessing oyster habitat restoration. He is currently a member of the National Shellfisheries Association and the Coastal and Estuarine Research Federation.

Peter Doering

Member

Dr. Doering is currently a Section Administrator in the Applied Sciences Bureau at the South Florida Water Management District where he leads a team of estuarine scientists and modelers. The goal of their work is to quantify the responses of estuarine ecosystems to changes in the quality and quantity of freshwater inflow. The results support comprehensive water resources management and are specifically applied to the development of Minimum Flows and Levels, Water Reservations, Total Maximum Daily Loads, Lake Regulation Schedules and the design and evaluation of Everglades restoration projects. Prior to this appointment he served as the district-wide expert on estuarine ecology. Dr. Doering has published extensively in the areas of water quality and water management as it impacts estuarine restoration efforts. He received a PhD in Biological Oceanography from the University of Rhode Island.

Frances Gulland

Member

Dr. Gulland is the Senior Scientist at The Marine Mammal Center. She has provided medical care for thousands of seals and sea lions, has published over 100 peer-reviewed articles, and is coeditor of the CRC Handbook of Marine Mammal Medicine. She chaired the Working Group on Marine Mammal Unusual Mortality Events for six years, has a lead role on recovery teams for the Hawaiian monk seal and southern sea otter, and is a member of the committee of scientific advisors to the Marine Mammal Commission. Dr. Gulland was sworn in as one of three Commissioners, U.S. Marine Mammal Commission, to serve the federal government with a focus on the protection and conservation of marine mammals. She served as a committee member on the NRC study entitled Alaska Groundfish Fishery and Stellar Sea Lions. She holds a DVM and PhD from the University of Cambridge.

Kenneth L. Heck, Jr.

Member

Dr. Heck is a Senior Marine Scientist and Professor at the University of South Alabama and Chief Marine Scientist and Chair of University Programs at the Dauphin Island Sea Laboratory. His research efforts focus on ecological studies of seagrasses and seagrass-associated macrofauna, especially shrimps, crabs and fishes. Dr. Heck's current studies include assessments of seagrass nursery value, investigations of herbivory, and the direct and indirect effects of nutrients and predator removal as they influence seagrass meadows. Furthermore, his work includes seagrass restoration projects and the evaluation of restoration efforts. He carries out both laboratory and field studies of seagrass-dominated ecosystems at the population and community levels, and employs a team approach to problem solving. Goals are to better understand the relative importance of physical-chemical and biological factors as they influence the health of seagrass meadows, as well as an increased understanding of how such high levels of plant and animal productivity are sustained in seagrass ecosystems. Dr. Heck received a PhD from Florida State University.

Matthew K. Howard

Member

Dr. Howard is a physical oceanographer with 37 years of experience and training. His interests include data management, informatics and interoperability. He has been involved with the U.S. Integrated Ocean Observing System (IOOS) since 1998 and served on their Data Management and Communication Steering and Quality Assurance of Real-Time Oceanographic Data Program Advisory Teams. He is a member of the Marine Metadata Interoperability Executive Team. He is currently the Data Manager for the Gulf of Mexico Coastal Ocean Observing System and a PI in the Gulf of Mexico Research Initiative Information and Data Cooperative. He has been the principal data manager for some of the largest field experiments conducted in the Gulf of Mexico including LATEX, NEGOM, and the MCH Hypoxia surveys. Recently he has become active in Gulf of Mexico glider deployments in support of hypoxia studies.

Michael S. Kearney

Member

Dr. Kearney is Professor in the Department of Environmental Science and Technology at the University of Maryland. His areas of specialization include coastal marsh processes and rates of marsh loss, sea level rise, barrier island dynamics, and applications of remote sensing to the study of coastal processes and land use change. He has published extensively on impacts of sea level rise, climate, and land use change as they relate to both the Atlantic and Gulf of Mexico coastal processes. Dr. Kearney received an MA in Quaternary Studies/Geomorphology from Western Illinois University and a PhD in Paleoclimatology/Environmental Reconstruction from The University of Western Ontario.

Paul Montagna

Member

Dr. Montagna is Endowed Chair for Ecosystem Studies and Modeling at the Harte Research Institute for Gulf of Mexico Studies, Texas A&M University Corpus Christi. He received an MS from Northeastern University and a PhD from the University of South Carolina. His research is on how organisms control and regulate marine ecosystems and coastal environments. He and his team focus on bottom-living organisms and the various attributes of water and sediment quality. This work is critical in guiding resource management decisions through his studies of environmental flows, nutrients, hypoxia, acidification, and oil and gas activities.

Pamela Plotkin

Member

Dr. Plotkin is Director, Sea Grant Texas at Texas A&M University. She is a broadly trained marine scientist who has spent most of her career conducting science to inform and influence domestic and international policies and conservation practices. She has a deep understanding of policies related to sea turtle conservation and restoration in the Gulf of Mexico and in the Pacific. She also has led administrative teams at three different institutions of higher education in research administration, development and support. Her early research career focused on the feeding ecology of loggerhead sea turtles in the Gulf of Mexico, which led to the discovery of their feeding grounds and a previously undescribed benthic community located in nearshore waters of the South Texas coast. During this time, she also worked at the University of Texas Marine Science Institute, where she studied marine pollution and its impact on marine organisms, and worked as a research assistant in the physical oceanography program during research cruises in the Gulf of Mexico. She holds a BS in Wildlife Science from Pennsylvania State University and an MS and PhD in Zoology from Texas A&M University.

Kenneth A. Rose

Member

Dr. Rose is the Associate Dean of Research in the School of the Coast and Environment and Professor, Department of Oceanography and Coastal Sciences at Louisiana State University. His current research is focused on modeling population dynamics of fish and aquatic food webs, and how they respond to a variety of types of stressors including changes in water flows and quality, lethal and sub-lethal effects of contaminants, hypoxia, alteration of physical habitat, and climate change. Dr. Rose has wide experience using a variety of types of monitoring data for evaluating restoration actions, their use in adaptive management, and as part of developing and testing ecological models. He recently published a model of the population dynamics of the delta smelt, which is a listed species in the California Delta that is the center of controversy about how much water can be pumped out of the system for irrigation and water supply, and he has also published on lower trophic level (algae and micro and macro zooplankton) food web dynamics. Dr. Rose was a member of review teams for several biological opinions involving delta smelt and salmon. He has served on two NRC committees, including the Committee on Sustainable Water and Environmental Management in the California Bay-Delta that evaluated the mitigation and conservation actions of biological opinions and the science underlying the short-term and long-term environmental and water usage decision-making of the system. He received a BS from State University of New York, Albany and an MS and PhD in Fisheries Science from the University of Washington.

Eric P. Smith

Member

Dr. Smith is a Professor and Department Head in the Department of Statistics at the Virginia Polytechnic Institute and State University. His research interests include: multivariate analysis and graphics, biological sampling and modeling, ecotoxicology, data analytics, and visualization. Dr. Smith previously served as a member of the National Research Council Committee to Review and Evaluate the Department of Interior's Biomonitoring of Environmental Status and Trends Program. He has received many awards and honors, namely being elected as a member of the International Statistics Institute and as a fellow of the American Statistical Association. Dr. Smith received his MS and PhD in biomathematics from the University of Washington.

Heather M. Tallis

Member

Dr. Tallis is Lead Scientist at The Nature Conservancy. She founded and directs the organization's Human Dimensions Program (HDP), an initiative to bring human well-being considerations into conservation practice from the planning stage forward. HDP advances the use of ecological, social and economic sciences in conservation and natural resource decision-making. Heather's current scientific inquiries focus on understanding hidden connections between nature and people, with specific focus on how classroom views affect learning, how individuals can have the greatest impact on water consumption and how natural resource management affects time use and poverty. Heather has led the development of open source software tools used broadly by governments and non-government groups to account for nature's benefits in environmental impact assessment, national accounting, land use planning, payment for ecosystem service design, and monitoring. She received an MS in Chemical Oceanography from the University of California, Santa Cruz, an MS in Marine Ecology from the University of Otago in New Zealand and a PhD in Zoology from the University of Washington.

Ronald Thom

Member

Dr. Thom is Staff Scientist at the Pacific Northwest National Laboratory. Additionally, he is an Affiliate Associate Professor in the School of Aquatic and Fisheries Sciences at the University of Washington. His research includes coastal ecosystem restoration; adaptive management of restored systems; effects of pollution; benthic primary production; climate change; and ecology of fisheries resources. He has worked on programs in systems in California, Washington, Oregon, Alaska, Massachusetts, New York, Nebraska, Alabama, and the Gulf of Mexico. Over his 43-year professional career, Ron has directed approximately 200 multidisciplinary ecological studies. He has published five book chapters, over 60 peer reviewed journal articles, hundreds of reports, made hundreds of professional presentations, and served on numerous professional committees. From 1985-1989 he chaired the Technical Advisory Committee of the Puget Sound Estuary Program. In 2009, Ron was appointed to serve on the Science Team that will guide research conducted by the Northwest Straits Commission, and in 2014 he was appointed to the Commission. Because of the growing international reputation of Ron and his group, he was invited to present a keynote address on Coastal Ecosystem Restoration in South Korea in June 2009. Based on this presentation and discussions with Korean scientists and federal agency officials, he was invited to formulate a research collaboration agreement with Inha University and Chungnam University, South Korea to focus on an ecosystem restoration program for that county. In 2010 he led the development and signed a Memorandum of Cooperation for joint research in coastal restoration between PNNL and East China Normal University, State Key Laboratory of Estuarine & Coastal Research in Shanghai, China. Ron was elected to the Washington State Academy of Sciences in 2010, and presently serves as a member of the Board of Directors of the Academy. He was selected to Chair the upcoming 2015 Coastal and Estuarine Research Federation (CERF) Conference. He received a BS in Biological Sciences from California State College, an MS in Marine Algal Ecology from California State University, and a PhD in Fisheries from the University of Washington.

Mark S. Woodrey

Member

Dr. Woodrey is a Coastal Ecologist at the Mississippi State University Coastal Research and Extension Center. He also serves as the Research Coordinator at the NOAA/Mississippi Department of Marine Resources Grand Bay National Estuarine Research Reserve in Moss Point, Mississippi, where he manages a monitoring program to assess restoration efforts in the estuarine reserve. Mark has extensive background developing monitoring programs and conducting avian conservation biology research. In addition to his recent focus on marsh bird research, he has studied a variety of bird groups including intercontinental landbird migrants, winter forest birds, colonial beach-nesting birds, grassland birds, and breeding birds of bottomland hardwood forests. He now coordinates the Grand Bay NERR's System-wide Monitoring Program; a national, standardized water quality and meteorological monitoring effort, and is involved in collaborative research projects focused on the ecology of estuarine fishes, effects of prescribed fire and sea level rise on coastal plant and animal communities, levels of mercury contamination in estuaries, and the nesting ecology of diamondback terrapins. The main goal of his research is to better understand the ecological relationships between coastal flora and fauna to facilitate the informed and effective management and conservation of coastal ecosystems along the northern Gulf of Mexico. He received his PhD in Biology from the University of Southern Mississippi.