

INDEPENDENT EXTERNAL PEER REVIEW

PANEL

for the

SAN JUAN METRO AREA

COASTAL STORM RISK MANAGEMENT STUDY

The U.S. Army Corps of Engineers submits the following information per requirements in the Water Resources Reform and Development Act of 2014, Section 1044(c)(4)(B).

Entity Conducting the Review	
Outside Eligible Organization:	Battelle 505 King Avenue Columbia, OH 43201
Dates of Review	
Review Initiation:	7/28/2020
Type I IEPR Final Report Submittal:	10/13/2020
Reviewer Names and Qualifications	
Wally Milon, Ph.D.	Plan Formulation/Economics
<p>Dr. Milon works as a Provost's Distinguished Research Professor in the Department of Economics at the University of Central Florida's College of Business Administration and is a founding faculty member of the National Center for Integrated Coastal Research at the University of Central Florida. He has 40 years of experience in natural resource and environmental economics and water resource economic evaluation and over 10 years of experience with public works projects.</p> <p>Dr. Milon is a former member of the National Research Council Committee on USACE Water Resources Science, Engineering, and Planning; the Committee on Water Resources Science, Engineering and Policy; and the Southern Economics Association. He also is the co-editor of the recent book, Coastal Resource Economics and Ecosystem Valuation, as well as more than 15 book chapters, 45 reports, and 40 journal articles.</p> <p>Dr. Milon is experienced in evaluating the USACE application of risk and uncertainty analyses in storm damage reduction studies in the southeastern United States. He is also experienced in Civil Works real estate laws, policies, and coastal property rights, and has conducted research on coastal property valuation. Dr. Milon has served as the lead economist on USACE IEPRs for large, complex Civil Works projects with high public and interagency interests involving flood risk management, ecosystem restoration, and coastal storm damage reduction, including the Caño Martín Peña Ecosystem Restoration Project, San Juan, Puerto Rico; the White Oak Bayou, Texas, Federal Flood Damage Reduction Plan; the Louisiana Coastal Areas Restoration Project; the Walton County, Florida, Hurricane and Storm Damage Reduction Project; and the Savannah Harbor Expansion Project, Fish Passage at New Savannah Bluff Lock and Dam.</p> <p>Dr. Milon is familiar with USACE's six-step planning formulation processes, procedures, and standards. He has more than 10 years of experience reviewing Federal water resource economic documents and evaluating construction projects for hurricane and coastal storm risk management, flood risk management, and ecosystem restoration, including projects developed under the USACE SMART Planning process and risk-informed planning. He has participated in planning and technical advisory support for the USACE Florida Everglades Restudy. In addition, he was an expert reviewer of the USACE Institute for Water Resources (IWR) "Monetary Measurement of Environmental Goods and Services: Framework and Summary of Techniques for Corps Planners."</p> <p>Dr. Milon has worked directly with USACE in applying Principles and Guidelines to Civil Works projects, analyzing National Economic Development benefits and costs, Regional Economic Development, and Other Social Effects. He was the principal investigator on the Socioeconomic Evaluation of Hurricane Evacuation Response project for the Florida Hurricane Research Alliance and was co-principal investigator on Florida's Coastal Environmental Resources: Economic Valuation and Analysis project.</p>	

Dr. Milon has taught graduate courses and conducted research in benefit-cost analysis, risk management, and flood damage assessment modeling, which includes the use of the Hydrologic Engineering Center Flood Damage Reduction Analysis (HEC-FDA) modeling software. He has also reviewed USACE projects utilizing probabilistic life cycle analysis models such as HEC-LifeSim, Beach-fx, and Generation 2 Coastal Risk Model (G2CRM).

Kris Thoemke, Ph.D.

Environmental Law Compliance

Dr. Thoemke has 41 years of experience as a National Environmental Policy Act (NEPA) expert and professional ecologist in South Florida. He has been a researcher and land manager for the State of Florida, a private ecological consultant, and an Everglades project manager. For the past 17 years, Dr. Thoemke has conducted marine and estuarine environmental assessments (EAs), environmental permitting, and listed species surveys along all Florida coasts and the Mississippi Delta in Louisiana. He has conducted water resource environmental permitting and prepared NEPA compliance documentation, including the assessment of cumulative effects. His experience with wetlands and estuarine ecosystems and coastal watersheds derives from his Ph.D. work on estuarine invertebrates; 11 years as manager of Rookery Bay National Estuarine Research Reserve in Naples, Florida; 4 years as a wetlands ecologist conducting Everglades restoration work; and 17 years as a wetlands and estuarine consultant.

Dr. Thoemke's direct experience includes work as a wetland scientist on the Florida Everglades restoration program; ongoing involvement as the environmental scientist for the Charlotte County Florida Erosion Control Project for Stump Pass; participation on a team working on large Civil Works restoration projects for the State of Louisiana in the Mississippi Delta region; and a professor teaching graduate-level environmental policy and management and NEPA classes. He has studied storm and construction impacts on the marine and terrestrial ecology of coastal regions and characterization of benthic communities, with a specific focus on the identification and assessment of construction impacts on seagrass, mangroves, shorebirds, and dune plant communities at Stump Pass and Blind Pass, Florida, and gopher tortoise habitat at Clam Pass and Vanderbilt Beach Parks, Florida. He has been characterizing benthic communities for more than 30 years. Dr. Thoemke also has extensive experience permitting and mitigating for construction impacts resulting from coastal and upland development, including assessing and monitoring impacts on beach and dune systems, nesting sea turtles, shorebirds, and upland listed species found in the coastal and beach/dune habitats. In addition, he has conducted post-storm analysis of beach and dune systems.

Dr. Thoemke prepared sections of the Environmental Impact Statement for the Terrebonne Basin Barrier Island Shoreline Restoration Project, Louisiana, including the Endangered Species Act and essential fish habitat (EFH) sections, and was the lead author of the West Grande Terre Beach Nourishment and Stabilization Project Environmental Assessment. He was project manager on the Port Everglades Ocean Dredged Material Disposal Site Environmental Assessment, which included Marine Mammals Protection Act listed species. In addition, he has completed Section 7 assessments for listed species under National Marine Fisheries Service jurisdiction for projects in several south Florida locations and coordinated with the U.S. Fish and Wildlife Service to prepare an updated Biological Opinion for swimming sea turtles and shorebirds on Marco Island, Florida. He has provided EFH consultation to several projects and continues to prepare EFH studies for marine and estuarine species as a part of his permitting work.

Michael Giovannozzi, P.E.

Hydrology and Hydraulic (H&H) Engineering

Mr. Giovannozzi is a coastal engineer with more than 20 years of engineering experience in both government and private sectors in the fields of coastal and hydraulic engineering, including deep draft navigation projects, flood risk, hurricane/CSRM, and coastal structures throughout the United States and Caribbean. He worked for 3 years with USACE Philadelphia District, 2 years with USACE Seattle District, and 15 years in private consulting. He is a professional engineer licensed in the states of Washington, Florida, Alabama, Connecticut, Georgia, South Carolina, Texas, North Carolina, New Jersey, and Delaware.

Mr. Giovannozzi has performed extensive hydrodynamic and sediment transport modeling, morphologic analysis, and EAs for multiple projects to determine expected water levels, tidal exchange, wave conditions, back bay dynamics, and circulation patterns. While at USACE Philadelphia District, he was the hydraulic engineer for a coastal inlet hydrodynamics study that involved numerical modeling to predict sediment transport potential for several alternative sand borrow-area strategies for a Federal beach fill project near a coastal inlet in Ocean City, New Jersey. For a dredging/environmental restoration project on the Intracoastal Waterway in Palm Beach County, Florida, Mr. Giovannozzi conducted tidal hydraulic modeling, channel optimization, and dredging cost estimates for hydraulic and mechanic dredging to restore tidal connectivity.

Mr. Giovannozzi also has specialized experience in subsurface investigations for channel design,

dredged material management, and the design of dredged material placement areas (i.e., open water, ocean disposal, and beneficial use). In addition, he is familiar with standard USACE H&H computer models and has been working with numerical modeling applications for navigation projects for more than 15 years. For example, he used the USACE numerical wave and circulation models, CMS Wave and CMS Flow, respectively, to assess channel realignment scenarios for the Quillayute Navigation Channel Improvement Study in Washington State.

Mr. Giovannozzi is familiar with the application of USACE risk and uncertainty analyses and coastal engineering requirements for feasibility studies. He is experienced in hurricane and flood damage risk analysis and is familiar with USACE risk registers and cost and schedule risk analysis. He has addressed Safety Assurance Review aspects on several USACE projects, including the Neah Bay Entrance Channel Breakwater Repair (Seattle District). He is also familiar with the IWR G2CRM model and has reviewed the model documentation as well as the training videos.

Mr. Giovannozzi is experienced in coastal storm surge and storm wave modeling using coupled ADCIRC models with both SWAN and STWAVE. Specifically, he utilized the coupled ADCIRC/SWAN model for Lake Superior to support coastal floodplain map updates for several counties in Federal Emergency Management Agency (FEMA) Region 5. He also provided the lead technical review for the coupled ADCIRC/SWAN model for the FEMA Region 10 coastal floodplain mapping for Puget Sound in Thurston County, Washington. In addition, he applied a coupled ADCIRC/STWAVE model to support FEMA Letter of Map Revisions for Horry County, South Carolina, for several private condominium associations located along the Atlantic Ocean.

Mr. Giovannozzi is an active member of the American Society of Civil Engineers; the Coasts, Oceans, Ports, and Rivers Institute; the Association of Coastal Engineers, and the Florida Shore and Beach Preservation Association. In addition, he served as the Secretary for the World Association for Waterborne Transport Infrastructure (PIANC) Recreational Committee Work Group on Marina Design and as PIANC YP-Com Vice-Chair of the Americas.

Doug Spaulding, P.E.

Civil/Geotechnical Engineering

Mr. Spaulding is a Principal and senior level geotechnical/civil engineer in the private sector, with 50 years of experience in the design, evaluation, and inspection of water-retaining structures, and civil and geotechnical engineering in general. He is a professional engineer licensed in the states of Wisconsin, Michigan, and Minnesota. He obtained a MSCE from Purdue University with a major study area in geotechnical engineering and a minor area in geology.

Mr. Spaulding has provided geotechnical design and evaluation services for flood risk management levees, embankments, and hydroelectric projects in a 23-state area. His experience includes 10 years with USACE, where he served as Chief of the Levee and Channel Design Section for the St. Paul District. He managed the design of the Pembina levee project in North Dakota and provided geotechnical/civil design services for local flood protection projects in Wisconsin, Michigan, Illinois, Iowa, Louisiana, and North Dakota. The Pembina project and others included extensive sections of floodwall (both I-wall and T-wall configurations). He also served as the Program Manager for the National Dam Safety Program in Wisconsin and Michigan.

Mr. Spaulding's experience with coastal structures is generally related to projects on the Great Lakes and the Gulf of Mexico. He managed the design of several breakwater and revetment projects on both Lake Superior and Lake Michigan. More recently, he provided peer review services on two reaches of hurricane protection projects in the New Orleans area. He also has served as a geotechnical engineer for the design of docking facilities for a large iron ore dock on Lake Erie. In 2014, he served on the IEPR for the West Shore Lake Pontchartrain Shoreline protection project near New Orleans, Louisiana. The project encompassed levees (including an 18-mile levee reducing the flood risk to more than 7,000 structures), floodwall and numerous closure structures, and utility crossings.

Over his career, Mr. Spaulding has provided design services, project management, and peer review for flood risk reduction projects located throughout the United States. These projects have included earth levee systems, diversion channels, concrete channels, floodwalls, gate wells, coastal revetments, and pumping stations. The foundation conditions for these projects have ranged from soft lacustrine clay deposits to stratified granular deposits requiring extensive seepage analysis and also relief well design. The majority were located in urban areas, which involved analysis of trade-offs between right-of-way costs and structural costs.

Mr. Spaulding has applied USACE risk-informed approaches to the evaluation of safety issues at USACE navigation, flood control, and hydroelectric projects. From 1988 to 2010, he also provided dam safety training for USACE operations personnel at navigation and flood control projects. Over the last 10 years, he has participated in more than 75 Potential Failure Mode Analysis (PFMA) evaluations of dams and hydroelectric projects. As a facilitator of PFMA evaluations authorized by the Federal Energy Regulatory Commission, he has directed more than 50 evaluations for embankment dams, concrete gravity

structures, and arch dam structures.

In addition, Mr. Spaulding has served as a civil/geotechnical member of IEPR review panels dealing with local flood protection projects such as levees, channels and floodwalls, dam remediation, dam replacement, and seepage control system upgrades. He has also provided peer review services on two reaches of hurricane protection projects in the New Orleans area. In 2008, he peer-reviewed the geotechnical design of the New Orleans Group 1 to Group 3 pump stations.