

# INDEPENDENT EXTERNAL PEER REVIEW PANEL

## for the Florida Keys, Coastal Storm Risk Management Study, Monroe County, Florida

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).

<b>Entity Conducting the Review</b>	
Outside Eligible Organization:	Battelle 505 King Avenue Columbia, OH 43201
<b>Dates of Review</b>	
Review Initiation:	29 December 2019
Type I IEPR Final Report Submittal:	22 May 2020
<b>Reviewer Names and Qualifications</b>	
<b>Wally Milon</b>	<b>Economist/Planning Formulator</b>
<p>Dr. Milon is the Provost's Distinguished Research Professor in the Department of Economics at the University of Central Florida's College of Business Administration and a founding faculty member of the National Center for Integrated Coastal Research at the University of Central Florida. He has taught graduate and undergraduate courses in benefit-cost and social impact analyses, economic theory, and natural resource and environmental economics. He earned his Ph.D. in economics from Florida State University in 1978 and has more than 40 years of experience in natural resource and environmental economics and water resource economic evaluation. He is a member of the Association of Environmental and Resource Economists and the American Economic Association. Dr. Milon is familiar with USACE and SMART plan formulation processes, procedures, and standards as they relate to ecosystem restoration and flood risk management. He has more than 10 years of experience reviewing Federal water resource economic documents evaluating construction projects for coastal storm risk management, flood risk management, and ecosystem restoration. He has participated in planning and technical advisory support for the USACE Florida Everglades Restudy and was lead economist on eight USACE IEPRs: the Everglades C-111 construction project; the Louisiana Coastal Areas Restoration Project; the White Oak Bayou, Texas, flood control plan; the Walton County, Florida hurricane flood risk study; the Caño Martin Peña Ecosystem Restoration Project, San Juan, Puerto Rico; the Rio Grande de Arecibo flood risk management study; the Lake Okeechobee, Florida Watershed Restoration Project; and the Savannah Harbor Expansion Project Fish Passage at New Savannah Bluff Lock and Dam Integrated Post-Authorization Analysis Report and Environmental Assessment. Dr. Milon is familiar with large, complex Civil Works projects with high public and interagency interests and has reviewed USACE projects utilizing probabilistic life cycle analysis models</p>	

such as HEC-LifeSim, Beach-fx and G2CRM. In addition, he has more than 25 years of experience in research and economic analysis related to fisheries economics and recreational fishing. Dr. Milon supervised several fisheries research projects for the National Marine Fisheries Service and served as a technical expert for Federal fishery management councils and journals. In addition, he conducted research on the initial development of the Florida Keys National Marine Sanctuary and was a co-principal investigator for the project "Human-Environment Linkages in the South Florida Coastal Ecosystem: Effects of Natural and Anthropogenic Stressors" funded by the Coastal Ocean Program, U.S. National Oceanic and Atmospheric Administration. Dr. Milon is the co-editor of the recent book, *Coastal Resource Economics and Ecosystem Valuation*, and more than 15 book chapters, 45 reports, and 40 journal articles. He has been involved in more than 25 university contracts and grants and serves as a private economic consultant to both government and private clients.

**Barry Vittor**

**Environmental Law Compliance  
Specialist**

Dr. Vittor is President and Senior Scientist at Vittor & Associates, with more than 48 years of experience in water resource planning, including port development, beach renourishment, and dune and barrier island reconstruction. He earned his Ph.D. in ecology from the University of Oregon. As a member of the Board of Directors of the Alabama Coastal Foundation and a member of the Mobile Bay National Estuary Program Management Committee, he has been very active in coastal resource management. Dr. Vittor has conducted National Environmental Policy Act (NEPA) impact assessments for USACE, U.S. Environmental Protection Agency (EPA), and other public sector and private clients. He has prepared environmental impact statements (EISs) and environmental assessments (EAs) and has conducted wetlands delineation; restoration and management studies; essential fish habitat assessments; benthic community impact assessments and baseline studies; and threatened/endangered species evaluations for numerous coastal area projects, including petroleum-related developments, shoreline protection and restoration, navigation-related projects, and beach renourishment projects. Dr. Vittor has assisted in regulatory agency permitting of hundreds of public and private projects throughout the southeast, for port developments, shoreline protection/restoration, beach renourishment, utility installations and other infrastructure projects, aquatic weed control programs, and hurricane-related debris cleanup. Examples include the Gulf LNG regasification plant on Bayou Casotte (Mississippi), flood control and ecosystem restoration feasibility studies of the D'Olive Creek watershed in coastal Alabama, post-Hurricane Katrina debris removal in coastal Mississippi and Alabama, and the programmatic EIS for New York District navigation projects in the Port of New York/New Jersey. Dr. Vittor is experienced in coastal storm risk management projects, particularly in urbanized coastal areas. He has been involved in EAs related to barrier island reconstruction after Hurricane Katrina; studies of port development impacts on wave run-up during major storm events; and USACE IEPRs for the Hereford Inlet to Cape May Inlet, New Jersey, Hurricane and Coastal Storm Damage Risk Reduction Project Draft Feasibility Report and Environmental

Assessment, and the Surf City and North Topsail Beach Integrated Feasibility Report and Environmental Impact Statement. He is familiar with the habitat and the fish and wildlife species that may be affected by project alternatives in a study area. He has studied ecosystems along the entire U.S. Atlantic and Gulf coasts regarding fisheries, benthic and demersal fauna, avifauna, and other biological resources, along with assessments of beach nourishment/sand borrow projects and port and navigation development projects. Dr. Vittor has extensive experience in most aspects of the Clean Water Act (CWA) of 1972, including Section 404 wetlands and streams, National Pollutant Discharge Elimination System (NPDES) discharge permit monitoring, ocean disposal of dredged material, and Section 408 Federal projects coordination. Dr. Vittor has handled hundreds of Section 404, Section 7 and Section 10 projects with the U.S. Fish and Wildlife Service (USFWS). He has also prepared Habitat Conservation Plans for a number of protected species. Dr. Vittor is familiar with the USFWS Habitat Evaluation Procedure (HEP) and has applied HEP and several other habitat functional value indices (e.g., Cover Type, HGM, WET, WRAP) to field assessments of port development projects along the Gulf Coast, navigation channel maintenance dredging/disposal in riverine and embayment projects in the New York District, and numerous private development projects. He has conducted numerous studies and surveys of plant and animal species listed under the Endangered Species Act (ESA), for a wide variety of public and private client projects, in the Gulf of Mexico and along the Eastern Seaboard. He has prepared biological assessments for terrestrial and aquatic species in accordance with USFWS guidelines and has addressed protected species of plants and animals in reviews of coastal beach and dune reconstruction projects on the U.S. Atlantic Coast. He has assessed essential fish habitat (EFH) impacts related to beach renourishment, sand borrow operations, petroleum development, and port/navigation projects along the U.S. Atlantic and Gulf Coasts, and has evaluated EFH impacts of storm debris removal operations in the northern Gulf of Mexico. Dr. Vittor is familiar with the Marine Mammals Protection Act and has assessed potential impacts of offshore oil and gas developments on marine mammals in the Gulf of Mexico, including noise effects, ship collisions, and seismic surveys. He has also participated in peer reviews of impacts of coastal dune and beach reconstruction on marine mammals along the U.S. Atlantic Coast and has coordinated with the National Marine Fisheries Service regarding potential impacts of storm debris clean-up operations on marine mammals (especially bottlenose dolphin) in the northern Gulf. Dr. Vittor has served on several USACE IEPR panels as a biology, ecology, and NEPA specialist for coastal storm damage reduction, flood risk management, deep draft navigation, and ecosystem restoration study.

**Michael Giovannozzi Coastal/Hydrology and Hydraulic Engineer**

Mr. Giovannozzi is a coastal engineer and independent consultant 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, throughout the United States. He earned both a B.S. and an M.S. in civil engineering from the University of Delaware, with a coastal engineering concentration for his graduate degree. He is a registered professional engineer in Washington, Florida, Alabama, Connecticut, Georgia, South Carolina, Texas, North Carolina, New Jersey, and Delaware. He worked for three years with USACE Philadelphia District (2001-2004), two years with USACE Seattle

District (2009-2011), and 13 years in private consulting. Mr. Giovannozzi has extensive experience designing navigation improvement projects in tidally influenced systems, including channel deepening projects. In the area of coastal current studies, Mr. Giovannozzi has performed extensive hydrodynamic and sediment transport modeling, morphologic analysis, and engineering assessments for multiple projects to determine expected water levels, tidal exchange, wave Conditions, 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. Mr. Giovannozzi was the coastal engineer for a dredging/environmental restoration project for an island community located on the Intracoastal Waterway in Palm Beach County, Florida. The work included tidal hydraulic modeling, channel optimization, and dredging cost estimates for hydraulic and mechanic dredging to restore tidal connectivity. He is familiar with the application of USACE risk and uncertainty analyses and coastal engineering requirements for feasibility studies (including channel design and effects of navigation channels on currents, sea level rise, sedimentation, and water quality). Mr. Giovannozzi has demonstrated experience in deep draft navigation channel design. Notably, he was involved in the hydrodynamic modeling and navigation studies of the canals for the World Islands Mega Project in Dubai, United Arab Emirates. The project required a balanced design that allowed for safe navigation of pleasure craft, provided sufficient flow to minimize siltation and improve tidal flow, while also minimizing shoreline erosion. The study included hydrodynamic and sediment transport modeling and determination of safe navigational clearances for vessels. In addition, Mr. Giovannozzi was the lead project engineer for a Section 905(b) Reconnaissance Study that examined the potential need for navigation improvements for the Neah Bay Entrance Channel in Washington State to enable deeper draft vessels to use the port for commerce and as a safe harbor of refuge. Mr. Giovannozzi also has specialized experience in subsurface investigations for channel design, dredged material management, and the design of dredged material placement areas (open water, ocean disposal, and beneficial use). He is familiar with both mechanical and hydraulic dredging technologies and has completed the USACE Dredging Fundamentals Course. While at USACE Seattle District, he was the project manager for the outer reach of the Grays Harbor Navigation Channel Maintenance Dredging project and worked with Miami Dade County on several channel and berth deepening projects at the Port of Miami. Mr. Giovannozzi recently developed a dredged material management plan for the Panama Canal Authority. The dredge disposal plan included best management strategies (including beneficial reuse) for six confined upland and nearshore disposal areas for marina and riverine dredging along the Pacific region of the Panama Canal. The work included a review of subsurface sediments for beneficial reuse, construction of internal dikes, and expansion of the perimeter dikes to optimize storage within the disposal areas. In addition, Mr. Giovannozzi is familiar with standard USACE hydrologic and hydraulic computer models and has been working with numerical modeling applications for navigation projects for more than 15 years. For example, the USACE numerical wave and circulation models, CMS Wave and CMS Flow, respectively, were used to assess channel

realignment scenarios for the Quillayute Navigation Channel Improvement Study in Washington State. The computer models were used to optimize the channel modification scheme to improve hydraulic efficiency with an aim to reduce future maintenance dredging activities. Recommendations were provided to alter the channel cross section and to rehabilitate a nearby sea dike to optimize the channel flow. Mr. Giovannozzi has also performed wave and circulation modeling for a navigation study to assess the feasibility of deepening the Intracoastal Waterway to accommodate deep-draft megayachts at a yacht repair facility located near the Port of Palm Beach in Palm Beach County, Florida. Mr. Giovannozzi 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 SAR aspects on several USACE projects, including the Neah Bay Entrance Channel Breakwater Repair (Seattle District). Mr. Giovannozzi is an active member of the American Society of Civil Engineers; Coasts, Oceans, Ports, and Rivers Institute; and the Association of Coastal Engineers. He regularly attends and presents at national and international conferences on flood damage reduction and shoreline protection. 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.

**Kipkoech Chepkoi**

**Civil/Geotechnical Engineer**

Dr. Chepkoi is the chief geotechnical engineer at Hanson Professional Services, Inc. and has 25 years of experience in geotechnical subsurface explorations and computation, analysis, and design of soil- structure interaction. He earned his Ph.D. in civil engineering (geotechnical) from the University of Maryland and is a registered professional engineer in Missouri, Louisiana, Illinois, Arkansas, Tennessee, Iowa, Michigan, Mississippi, Indiana, Florida, New York, Washington, Oklahoma, and Ohio. His specific geotechnical expertise is in deep and shallow foundations design; geotechnical seismic evaluation and design; retaining structures; settlement of structures and embankments; slope stability and stabilization; soil shrink/swell/collapse and remediation; shoring and retention systems; non-destructive testing of foundations; site grading and compaction; and soil improvements and stabilization using deep dynamic compaction and chemical stabilization. Dr. Chepkoi has experience performing engineering during construction (EDC) services during his work on the Devils Lake City Embankments for USACE St. Paul District. His responsibilities included designing a 6-foot raise to the existing embankment, designing a new pump station compatible with the raise, documenting the design analysis, preparing construction plans and specifications, preparing the construction cost estimate, and responding to questions and preparing amendments during the solicitation period. Dr. Chepkoi has familiarity and experience with the structural and nonstructural measures used in coastal storm risk management. He participated as a geotechnical engineer on the Hurricane Storm Damage Risk Reduction System, USACE New Orleans District Lake Pontchartrain Vicinity (LPV) floodwall and levee projects, providing engineering services for design and construction of the floodwalls and levees; participating in the design process, determining the geological/soil profiles, and soil parameters; performing global stability analyses, settlement analyses, pile capacity analyses; determining downdrag forces; evaluating cofferdam design and temporary shoring during construction sequencing; and preparing

plans and specifications. Dr. Chepkoit has familiarity and experience with the porous limestone geology of the Florida Keys and other challenging geological units nationwide. For the Florida Department of Transportation and City of Jacksonville, he reviewed plans for the bridge foundation of a highway interchange and modeled temporary shoring for stage construction; and preparation of specifications and construction drawings. As the geotechnical engineer for the Monroe County Board of Aviation in Bloomington, Indiana, Dr. Chepkoit evaluated effective and long-lasting solutions to sinkholes along the west edge of Runway 17-35 at the airport, conducting the geotechnical exploration, preparing a geotechnical recommendation report, design and construction plans. For the Missouri Department of Transportation, for the Route 160 bridge over Interstate 1-44, Dr. Chepkoit was the geotechnical engineer responsible for deep foundation. Recommendations (per load and resistance factor design) for end bearing piles on predrilled pinnacled bedrock; analysis and design of mechanically stabilized earth walls; stage construction; and preparation of specifications and construction drawings. For a private venture that was constructing wind turbines in New York, Dr. Chepkoit was the geotechnical engineer responsible for gravity foundation recommendations on soil and karstic bedrock (soluble rock). He performed standard and cone penetration tests, geophysical analysis, and developed a report with recommendations. Dr. Chepkoit was an IEPR reviewer of the geotechnical engineering for the New Orleans Hurricane and Storm Damage Risk Reduction System LPV 145, which involved review of analyses, design, plans and specifications for hurricane protection system improvements including pile supported floodwalls. The project involved the construction of 5.75 miles of pile supported T-wall to provide hurricane risk reduction for the 1% design storm event. For the USACE Chicago District, CUP McCook Reservoir, Dr. Chepkoit was the IEPR reviewer of the geotechnical engineering. He reviewed the design of the 22,000 acre-foot McCook Reservoir at four different stages of completion: a review of the 100% complete plans and specifications; a construction phase review at 50% complete; a construction phase review at 95% complete; and operation and maintenance, repair, replacement and rehabilitation documents and manuals. He is an active member of the American Society of Civil Engineers (St Louis chapter), Society of American Military Engineers (St. Louis Post), and the National Council of Examiners for Engineering and Surveying.