



**Company Role**

Senior Research Scientist

**Project Role / Focus Areas**

- Flood risk management
- Numerical and physical modeling
- Coastal engineering
- Climate change adaptation

**Education**

- Ph.D. – Civil and Environmental Engineering (Coastal Engineering), University of Delaware - 2005
- M.S. – Civil and Environmental Engineering (Coastal Engineering), University of Delaware - 1999
- B.Tech. – Ocean Engineering and Naval Architecture, Indian Institute of Technology, India – 1997

**Professional Registrations**

- Professional Engineer – TX
- Transportation Workers Identification Credential (TWIC)
- ASCE ACOPNE Diplomate in Coastal Engineering (D.CE)
- ASCE ACOPNE Diplomate in Port Engineering (D.PE)

**Experience Profile**

Shubhra Misra is a Senior Research Scientist and Climate Resilience Specialist for the Water Institute. He has more than 15 years of extensive and effective team-oriented leadership, coordination and management experience in the planning, execution, management and delivery of complex, large multi-disciplinary civil works (coastal and marine) projects. He recently served as the Hydrology-Hydraulics-Coastal lead in USACE Galveston’s largest coastal storm risk management project and as a Climate Preparedness and Resilience Specialist in the Department of Defense Climate Action Plan’s Climate Action Team. Misra has extensive experience in developing civil designs for hydrological, hydraulic, coastal and marine engineering project aspects and reviewing studies, plans, specifications, and drawings for features of design to ensure a fully coordinated and compatible outcome. He has a focus on site-selection, design, constructability, construction and operation of coastal, marine and civil works infrastructure, navigation, flood risk management (including sea level rise and climate change), dredging and reclamation, cost and construction schedule estimating, numerical and physical modeling of hydraulic and coastal processes (waves, water levels, currents, sediments), vessel motions and wave-structure interactions, met-ocean studies, marine environmental and ecosystem impact assessments, contractor and vendor supervision and management, office and staff development, stakeholder engagement and business management.

**Professional Experience**

U.S. Army Corps of Engineers	
• <i>Civil Engineer (Hydraulics)</i>	2018-2021
Chevron	
• <i>Marine Facilities Engineer</i>	2012-2018
AECOM	
• <i>Senior Project Manager</i>	2011-2012
Ben C. Gerwick, Inc. (now COWI, USA)	
• <i>Project Manager, Area Manager</i>	2009-2011
HPA, Inc. (now Jacobs)	
• <i>Senior Coastal Engineer</i>	2005-2009
University of Delaware	
• <i>Post-doctoral Associate</i>	2005
• <i>Research Assistant</i>	1997-2005

**Selected Projects (continued on page 2)**

**Texas General Land Office River Basin Flood Study.** Technical coastal lead managing a diverse team of researchers focused on a state-wide implementation of hydrological and hydraulic modeling of tropical and non-tropical storms, extended joint probability methods and optimal sampling, uncertainty and bias quantification, recurrence analysis and development of compound flood hazard maps. Managing engagement and alignment with client, state and federal stakeholders including USACE SWF, SWG and USACE ERDC.

**Louisiana Watershed Initiative.** Technical lead for the pilot project managing a diverse team of researchers focused on a state-wide implementation of hydrological and hydraulic modeling of tropical and non-tropical storms, extended joint probability methods and optimal sampling, uncertainty and bias quantification, recurrence analysis and development of compound flood hazard maps. Managing engagement and alignment with client, state and federal stakeholders, external technical reviewers and advisory groups.

**Department of Defense (DoD) Climate Action Team.** Served as a Climate Preparedness and Resilience Specialist in the Climate Action Team (CAT). Provided inputs to the DoD Climate Adaptation Plan, performed Climate Exposure Assessments of DoD Installations using the Defense Climate Assessment Tool (DCAT), personnel, operations, mission areas worldwide (recently for INDOPACOM to respond to Joint Staff queries). Developed strategy for Climate Vulnerability assessment using the Exposure, Sensitivity and Adaptive Capacity (ESAC) framework. Summarized climate change research within the Earth system and its subsystems to evaluate severity of environmental hazards to DoD.

**Sabine Pass to Galveston Bay Pre-Construction, Engineering and Design (PED) Coastal Storm Risk Management Project.** Lead Hydrologic/Hydraulic/Coastal Engineer for USACE Galveston district's largest civil works pre-construction, engineering and design (PED) project in the district's history. Led and managed a large team of hydrologic, hydraulic and coastal engineers within the USACE across the as well as several academic researchers in delivering hydrological/hydraulic/coastal design parameters for the project. The ~ \$4B project includes Gulf and bay waters, barrier islands, marshes, coastal wetlands, rivers and streams and adjacent areas that make up the interrelated coastal area. The recommended plan includes three Coastal Storm Risk Management systems (CSRMs) consisting of new levee/floodwalls systems, drainage structures, road/railroad closure structures, navigable sector gate structures and pump stations. Led several innovative R&D efforts to supplement design activities and reduce uncertainty/risk including statistical and numerical assessment of coastal surge and waves, compound flooding, application of natural and nature-based features (NNBF) using Engineering-with-Nature (EwN) principles, application of Boussinesq models in storm wave transformation (including infragravity wave generation), ship-induced waves and run-up/overtopping.

**USACE Nationwide Working Groups – Frequent Flooding and Coastal Compound Flooding.** Part of two nationwide working groups that have been formed to identify agency gaps and challenges in Compound Flooding and Frequent Flooding with regard to existing authority/interpretation, update and develop best practice/guidance and provide recommendations on research and development. Reviewed a variety of climate change research within the Earth system and its subsystems to evaluate severity of environmental hazards related to Compound Flooding and cascading hazards.

**South Padre Island Sand Management Plan – Lead Engineer on a Public Assistance to States (PAS) project to develop a Sand Management Plan for South Padre Island.** Work involves sand tracer field study, performing a sediment budget analysis, deployment of a mini-ARGUS system, development of alternatives for backpassing/bypassing including nearshore BUDM, numerical waves, hydrodynamic and morphological modeling.

## **Publications**

1. Santos, V. M., Wahl, T., Jane, R., **Misra, S. K.**, White, K D. (2021). *Assessing compound flooding with multivariate statistical models in a complex estuarine system under data constraints*, Journal of Flood Risk Management. e12749. DOI: 10.1111/jfr3.12749.
2. Loveland, M., Kiaghadi, A., Dawson, C. N., Rifai, H.S., **Misra, S.K.**, Mosser, H. and Parola, A. (2020). *Developing a modeling framework to simulate compound flooding: When storm surge interacts with riverine flow*. *Frontiers in Climate* 2:609610. doi: 10.3389/fclim.2020.609610
3. National Academies of Sciences, Engineering, and Medicine (2018). *Understanding the Long-Term Evolution of the Coupled Natural-Human Coastal System: The Future of the U.S. Gulf Coast*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25108>.
4. Kirby, J. T., Shi, F., Nicolsky, D. and **Misra, S. K.**, (2016). *The 27 April 1975 Kitimat, British Columbia submarine landslide tsunami: A comparison of modeling approaches*. *Landslides*, 13, 1421-1434.
5. Yang, X., Kerper, D., **Misra, S. K.**, Stear, J., Shen, T. and Lisaeter, K. (2018) *The dynamics of storm surge and mean sea level variability in the north-eastern Caspian sea*, 36th International Conference on Coastal Engineering (ICCE), Baltimore, July 2018
6. **Misra, S. K.**, Kirby, J. T., Brocchini, M., Veron, F., Thomas, M. and Kambhamettu, C., (2008) *The mean and turbulent flow structure of a weak hydraulic jump*, *Physics of Fluids*, 20, 035106
7. Veron, F., Saxena, G., and **Misra, S. K.** (2007) *Measurements of the viscous tangential stress in the airflow above wind waves*, *Geophys. Res. Lett.*, 34, L19603, doi:10.1029/2007GL031242
8. **Misra, S. K.**, Kennedy, A. B. and Kirby, J. T., (2003) *An approach to determining nearshore bathymetry using remotely sensed ocean surface dynamics*, *Coastal Engineering*, 47, 265-293