DISTINGUISHED SEMINAR SERIES

Hosted by the Department of Civil and Environmental Engineering
at Northeastern University

Coastal Resilience and Adaptation

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12PM - 1PM Eastern

Churchill 103

We look forward to you joining us.

Abstract: Coastal hazards are linked to climate change through sea level rise and extreme local sea levels and waves that result in increased flooding, erosion, salinity intrusion, ecosystem loss/change, and impeded drainage. The direct impacts include loss of life and injury, damage to the built environment, loss of ecosystem services, and loss of land. Coastal engineering strategies to respond to sea level rise include to do nothing, build protective structures (e.g., sea walls and levees), accommodate flooding by raising infrastructure, advance the shoreline, or retreat from the coast. Hybrid coastal protection approaches that include natural and natured-based features (NNBF) provide both coastal engineering and ecosystem benefits. NNBF are landscape features that are developed to provide engineering functions relevant to flood risk management while producing additional economic, environmental, and social benefits. The concept is to intentionally align natural and engineering processes to deliver benefits efficiently and sustainably. Examples of coastal NNBF are dunes and beaches, vegetated features, reefs, barrier islands, and maritime forests. NNBF approaches to coastal protection are gaining attention, but design guidance and quantitative assessment of engineering performance are lacking. Challenges to implementation of NNBF include development of guidance for designing and maintaining features, quantifying the performance of hybrid structures, uncertainty quantification, and understanding the long-term evolution of NNBF in a changing, nonstationary climate. Achieving coastal resilience requires rigorous risk-based coastal system hazard assessment, mainstreaming use of NNBF, building adaptive capacity into designs, and collaborating across disciplines and stakeholders.

Bio: Smith is an Emeritus Senior Research Scientist at the US Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory in Vicksburg, MS, and Research Professor at University of Florida. She earned a PhD from University of Delaware in Civil Engineering with an emphasis in Coastal Engineering. Her research focus is on coastal hydrodynamics, including nearshore waves and currents, shallow-water wave processes, and storm surge. Her projects include theoretical and numerical studies as well laboratory and field experimentation. Smith serves on editorial boards for Coastal Engineering; Journal of Waterway, Port, Coastal and Ocean Engineering; and Frontiers in Built Environment. She is a Distinguish Member of American Society of Civil Engineers and a member of the National Academy of Engineering. She has 200 professional publications.