

COASTAL RESILIENCE & NATURE BASED SOLUTIONS- A DEED PROJECT

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This collaborative project funded by the Department of Defense aims to determine the appropriate wetland locations for shellfish-enhanced nature-based living shorelines along the Delaware and Chesapeake Bay Estuaries. The goal is to evaluate sites for the potential to develop, deploy, and evaluate a novel coastal protection strategy consisting of multiple shellfish-based strategies across the shallow subtidal and intertidal expanse. The integrated approach to shellfish/wetland protection features a mosaic of habitats (oyster, ribbed mussel, wetland vegetation) deployed as an array of integrated components to dampen wave energy and facilitate sedimentation at a wide range of elevations, thus maximizing the protective potential. Through evaluation of the installation, we seek to determine the feasibility of regenerative nature-based solutions (NBS) in mitigating the effects of SLR and extreme events on landward regions and infrastructure in local estuaries while considering upland urban pressures, infiltration, and water quality on wetland functions and health. An interdisciplinary team of engineers, scientists, and landscape architects are working together on the project to with the goals of 1) enhancing understanding of sediment movement at the land/water interface through detailed measurements of coupled surface water, subsurface water, and geotechnical characterization; 2) yielding critical data on infrastructure resilience and adaptation, especially important for the numerous military installations in close proximity to the coast; 3) developing numerical models; 4) enhancing understanding of nature-based solutions to adapt and recover from impacts; and 5) determining associated benefits for community members. In year one of this four-year project, we conducted an evaluation of scientific and gray literature to determine primary research gaps, and we developed a site suitability model to determine where a natural or hybrid shoreline would be feasible. The project ecologist tested potential sites for shellfish recruitment and the team is currently working on design and permitting for one installation. This work builds from a theoretical framework developed during an interdisciplinary academic project that focused on blue carbon evaluation as a design and funding driver. For this project, we will employ land use forecasting and the InVEST blue carbon modeling software to describe the blue carbon benefits as well as the loss of carbon sequestration benefits over time.

PRESENTER BIO: Dr. Jules Bruck, RLA is Director of the School of Landscape Architecture and Planning, and Professor and Chair of the Landscape Architecture Department at the University of Florida. Previously, as founding Director of Landscape Architecture at the University of Delaware, she co-founded the Coastal Resilience Design Studio (CRDS) which employs interdisciplinary teams of undergraduate students to create resilience plans for coastal communities. CRDS projects have received numerous state and nation.