

Engineering With Nature

Project Fact Sheet



Application of Engineering With Nature® to Enhance Urban Marsh Resiliency, Biodiversity, and Habitat

Background

Nature-based solutions (NBS), such as tidal flats, saltmarshes, and wetlands, in coastal urban areas provide critical functions to enable coastal resiliency, including flood risk management and ecosystem services (e.g., habitat, water quality enhancement, recreation). However, threats from sea level rise and climate change are intensifying pressures on these systems and new approaches are needed to enhance their functionality and broaden their benefits. There is an opportunity to improve coastal resiliency in these urban environments through the application of Engineering With Nature® (EWN®) principles that will leverage natural processes, produce efficiencies, broaden benefits, and increase collaboration. This project will leverage a multidisciplinary collaborative team to focus on aligning economic, social, environmental, and engineering benefits through promoting marsh genetic diversity, offsetting habitat loss, providing flood risk management, improving marsh sediment budgets, and improving water quality in a highly urbanized region.

Objectives

This project will leverage ongoing partner collaboration to use EWN® concepts and principles to increase climate resiliency and to enhance biodiversity and ecological functionality of the Belle Isle Marsh in Boston MA. The project will demonstrate the resilience services provided by urban coastal marshes at a local and regional scale. Lessons learned from this project will be broadly applicable to other similar coastal marsh ecosystems in urban areas. Furthermore, this project will help protect coastal environmental justice communities from the effects of sea level rise and coastal storm surges.

Approach

The ERDC project team will join the existing Technical Advisory Committee (see figure below) to provide engineering, design, and permitting guidance and expertise. The approach will include (1) review and recommend marsh management design alternatives that incorporate EWN® practices, (2) develop permitting recommendations in support of beneficial sediment use, (3) assess plant genetic diversity of the Belle Isle marsh management plan, and (4) disseminate results of the project through web content, podcasts, webinars, story maps, and technical narrative.

Outcomes

Working in Belle Isle Marsh will strengthen USACE's capability in, and build capacity for, applying EWN® principles in urban coastal marsh settings at the field scale. This project will leverage existing natural processes and marsh enhancement efforts to better harness local and regional hydrodynamic conditions, improve water quality, apply beneficial sediment use in a sediment starved environment, and promote habitat enhancement and increased biodiversity to address genetic erosion and marsh degradation by multiple stressors. Social, environmental, and economic benefits include improved coastal resiliency, reduced flood risk, and protection of environmental justice communities, improved public health through better water quality and flood protection, and improved operational efficiencies of water resources infrastructure.



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