

Engineering With Nature Project Fact Sheet



Great Lakes Engineering With Nature® (EWN®) NNBF/MLD Playbook

Background

Great Lakes communities along the Great Lakes coast line are experiencing increased frequency in coastal flooding and erosion, causing property damage, putting lives at risk, and disrupting local economies. Recent historic high lake levels illustrate the widespread vulnerabilities along the coast. Natural and Nature Based Features (NNBF) are measures and techniques that can be incorporated into shoreline protection to reduce flood risk and improve resilience of coastal and inland water systems. NNBF integrates naturally with the concept of Multiple Lines of Defense (MLD), whereby multiple strategies are used to erect a system of comprehensive, resilient, and sustainable coastal risk solutions. However, current understanding of NNBF and MLD coastal resiliency measures is mostly limited to ocean coast, resulting in lack of confidence on the applicability and cost-benefit of these measures in the Great Lakes. Engagements and discussions with Great Lakes Communities revealed the need for NNBF guidance specific to the Great Lakes. Without greater understanding and guidance, a paradigm shift from traditional flood risk management (FRM) practices to NNBF will not occur. USACE also needs this guidance to confidently consider these types of measure as part of the Great Lakes Coastal Resiliency Study (GLCRS) and related spin-off studies. There are 4,530 miles of U.S. coastline for the five Great Lakes, more than double the coastline along the U.S. Atlantic Ocean, and more than three times the coastline on the U.S. West Coast, further underlining the need for Great Lakes specific NNBF guidance.



Objectives

The objective of this project is to develop a Great Lakes specific guide (“playbook”) to Natural and Nature Based Features (NNBF) and Multiple Lines of Defense (MLD) to improve future coastal resiliency. The guide will significantly advance the understanding of NNBF and MLD emerging technologies as applied to the entire Great Lakes region. The guide will provide additional needed confidence to federal, state, and local government agencies to plan, design, and implement sustainable, adaptable and cost-effective NNBF measures, either instead of, or in addition to, traditional structural and non-structural flood risk management (FRM) practices.



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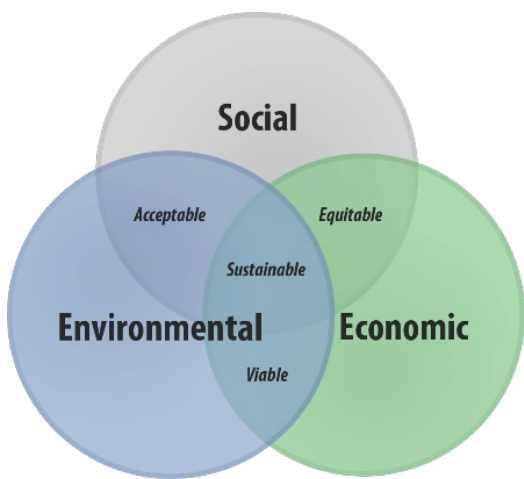
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Approach

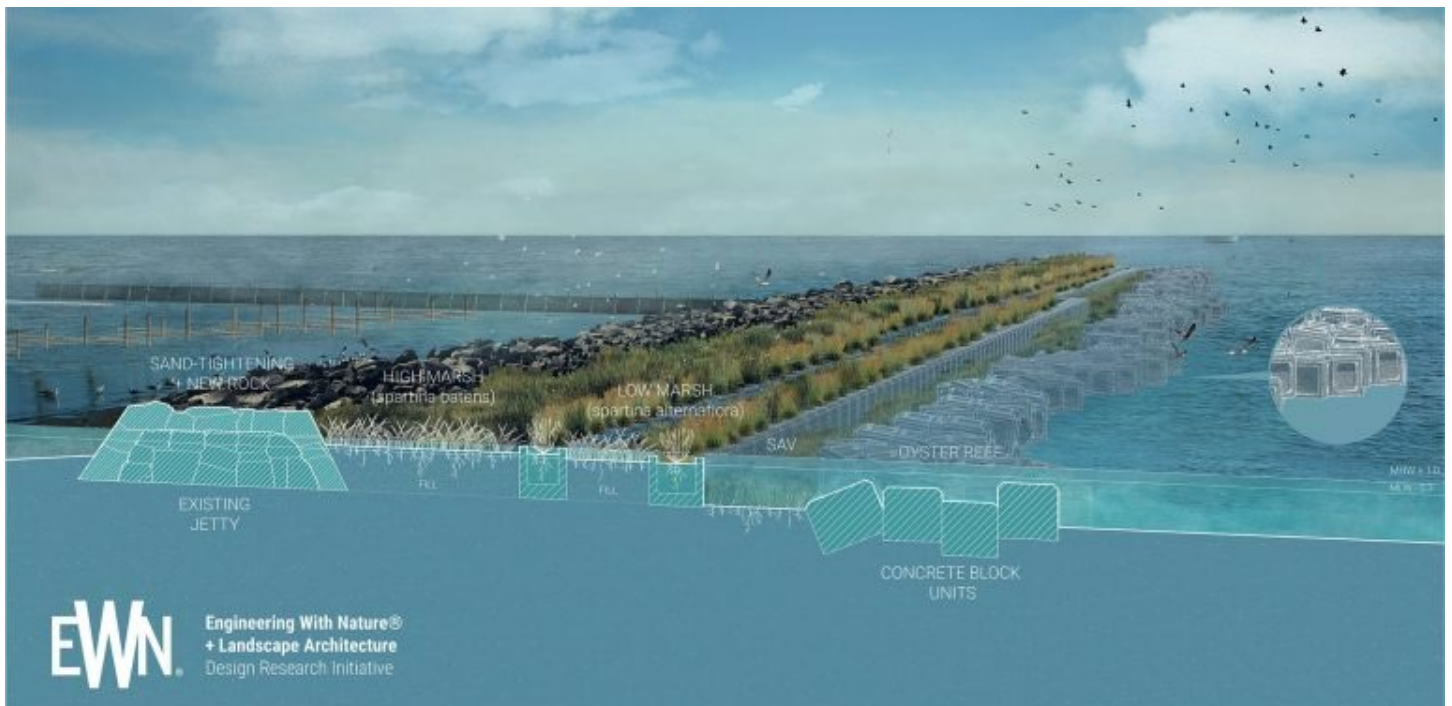
This project uses a three-pronged approach to developing the guidance, consisting of:

- Working with partners to identify existing NNBF and MLD projects and assess and quantify their performance and cost under a range of conditions in the Great Lakes.
- Utilize EWN principles to develop new conceptual designs specific to the Great Lakes that achieve greater resiliency and adaptability than conventional FRM designs.
- Estimate adaptive capacity, failure tipping points, and planning level cost/benefit performance outputs of innovative conceptual NNBF and MLD designs under a range of current conditions and future climate scenarios.



Outcomes

The project will enable innovative NNBF and MLD coastal resiliency solutions to be planned, designed and implemented across Great Lakes into the future, resulting in social benefits (less loss to recreational amenities and personal property), economic benefits (less disruption to local economic activities), and environmental benefits (restoration of Great Lakes coastal ecosystems).



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