

Reproducible Framework: Standardized Methods to Score Resilience-Focused Outcomes of Natural Infrastructure

OVERVIEW

The U.S. Army Corps of Engineers (USACE) is developing a standardized, multi-criteria framework to evaluate the resilience benefits of natural infrastructure (NI) and nature-based solutions (NBS). Traditional evaluation methods often prioritize monetizable outcomes and overlook broader ecological and community benefits. This project will review existing approaches and build a new framework that includes tools like the Biodiversity Security Index (BSI) to better capture holistic, resilience-focused outcomes. A case study in the Great Lakes Region will guide the framework's development in collaboration with USACE planners and partners. Results will be published in a methods paper to promote transparency and support wider adoption of NBS in USACE planning and decision-making.

By enabling comparison of alternatives using both quantitative and qualitative metrics, it advances sustainable development strategies, improves decision-making, and supports broader investment in NBS as viable infrastructure solutions.

BROADEN BENEFITS

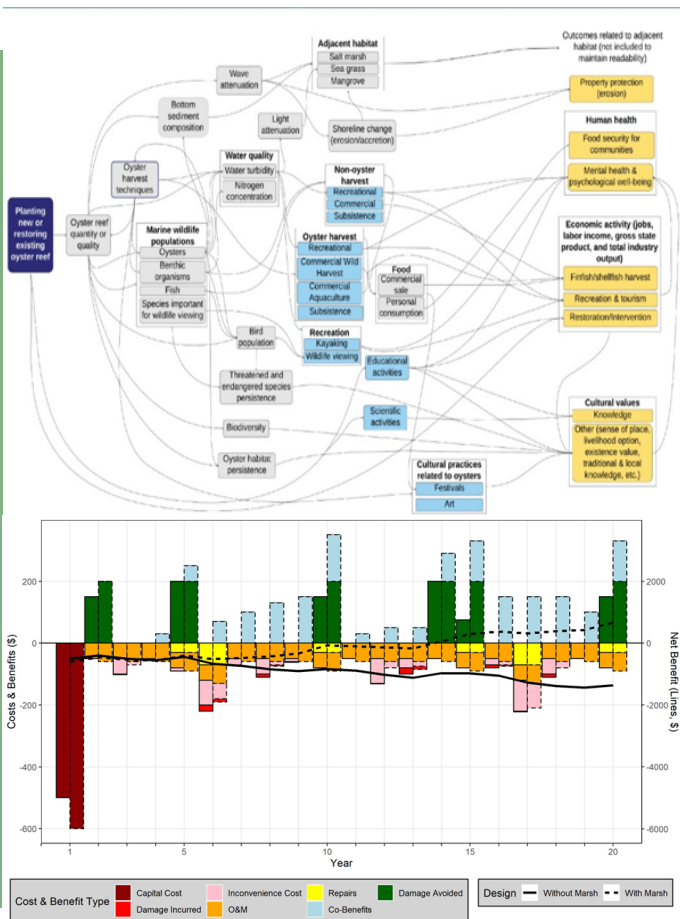
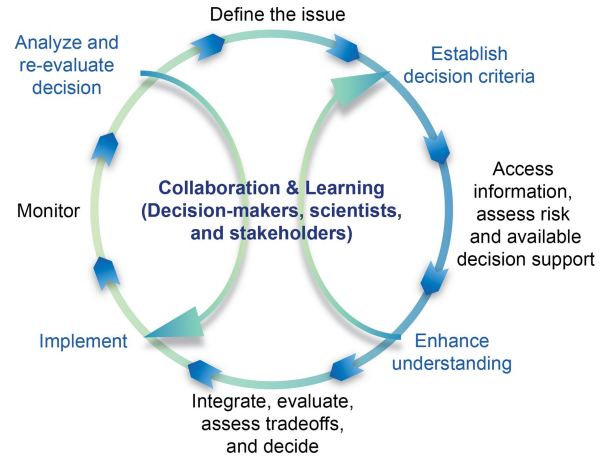
Enabling USACE practitioners to account for benefits will incentive projects to seek greater public advantages beyond the traditional, narrow focus. The framework will especially consider how to support new benefit categories such as access, connectivity, and broader community opportunities by targeting resilience-enhancing improvements in areas with limited prior resource investment



COLLABORATIONS

The project will involve extensive collaboration across USACE districts (e.g., Buffalo, Detroit, Chicago) and with academic organizations. A multidisciplinary team will integrate expertise from environmental science, engineering, and policy to achieve project goals. Several team members work from district locations, which facilitates district communication and partnering.

Decision-Making Framework



OBJECTIVES

- Conduct a literature review on existing frameworks and methodologies used to assess the benefits of natural Infrastructure.
- Identify key components, strengths, and limitations of current approaches.
- Consult with practitioners and framework developers to understand the suitability to meet USACE needs, especially during plan formulation and comparison of alternatives.
- Standardization of methods for calculating benefits using indicator values to include ongoing efforts with USACE.
- Development of a grading system to quantitatively compare the benefits of various nature-based solutions. Given the context-specific nature of the relative value of project attributes, the tool will likely have a geospatial information system (GIS) component that represents scores.