



**US Army Corps of Engineers**

# Environmental Sustainability Innovations and Coastal Infrastructure Design



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**Project Concept:** Navigation infrastructure projects are prominent features of the nation's waterways. However, few of these projects were designed with any specific features intended to support ecosystem services because the concept of accomplishing both the engineering and additional specific environmental goals is, in most instances, a new idea for many planners and designers. The goal of this project was to identify opportunities to increase environmental enhancements of navigation infrastructure (EENI) projects and to build on USACE sustainability goals.

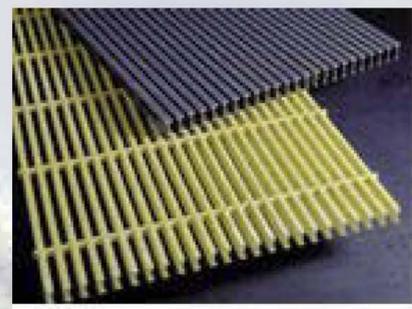
**Project Approach:** The project was a national effort sponsored by the Dredging Operations and Environmental Research (DOER) Program that investigated opportunities, impediments, and research needs for EENI throughout the US. A number of communication routes were taken including email, webinars, and an online survey. Over 400 individuals were introduced to the project and made aware of the survey. A commercial, internet-based software tool was used to implement the survey on attitudes, ideas, concerns, existing projects, unsuccessful projects, relevant laws and regulations, case studies, and participant demographics. As a result, a large number of ideas and projects were identified to illustrate the EENI concept.

## Selected Existing EENI in Coastal Systems:

- Pea gravel around toe of breakwater for fish spawning
- Eelgrass planting in anchorage
- Shaped breakwater to create habitat variety
- Light transmitting dock materials (Figure 1)
- Dredged material island topped with oyster shell for tern habitat

## Selected EENI Ideas:

- Modify breakwater toe, rock sizes, cross section, etc. to create habitat variety (Figure 2)
- Glue oyster shell to hard structures to encourage colonization
- Add marine mammal haul-out shelves to jetties
- Add osprey nesting platforms to structures
- Create terraces in channel side slopes for sea grass

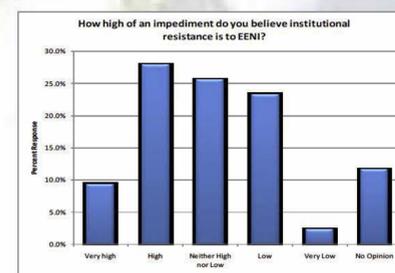
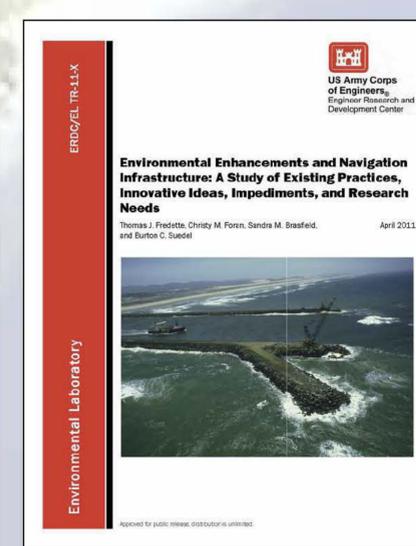
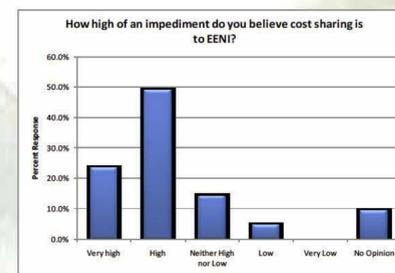
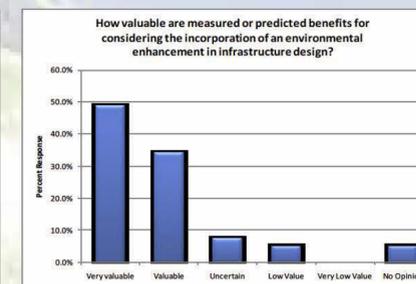
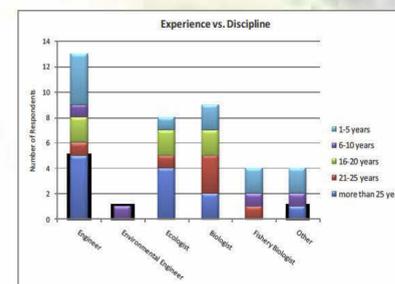
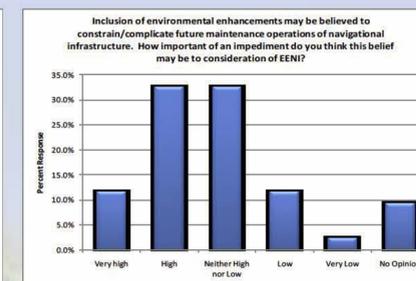
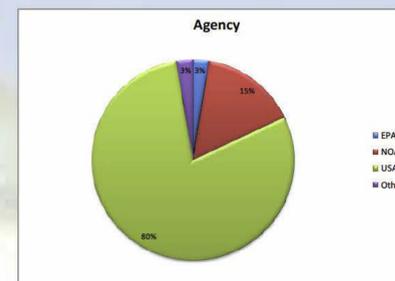


**Figure 1.**



**Figure 2.**

## Survey Results



## Suggestions to Reduce Impediments:

- Greater stakeholder interaction
- Interagency agreements
- Special program funding
- Promote the EENI concept
- Document case studies
- Develop agency goals/metrics

## Research and Other Needs:

- Document case studies and benefits
- Conduct demonstration projects
- Develop success assessment tools
- Prioritization of sites where EENI might work

## Next Steps:

- Promote the EENI concept
- Establish EENI goals
- Document case studies and benefits
- Develop pilot projects of innovative ideas



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