# ERDC-SWG Demonstration Workshop on Engineering with Nature

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**ABSTRACT.** The United Sates Army Corps of Engineers (USACE) Engineers, Research and Development Center (ERDC) and Galveston District conducted a field-based Engineering with Nature (EWN) workshop demonstrating the application of native plant species to enhance engineering objectives while maximizing environmental benefits of natural features to enhance the structural integrity of dikes in placement areas in the Galveston Bay, Matagorda Bay, Corpus Christi Bay, and surrounding ecosystems. The workshop provided instructions to an interagency group on EWN principles. This is first of the planned series of EWN field-based workshop facilitated by ERDC to train USACE engineers, scientist, and project managers on new techniques to manage dredge material placement areas (DMPAs) using native vegetation. Participants gained field experience in new planting techniques, and identified potential applications of EWN into ongoing and new projects within the Southwest Division.

## INTRODUCTION

- USACE-ERDC and National Oceanographic and Atmospheric Administration (NOAA)-National Ocean Service (NOS) conducted a workshop (March 2016) on Natural and Nature-Based Features. Participants identified a set of projects as priority candidates for EWN.
- The use of native vegetation on DMPAs ranked third in priority for utilizing EWN principles and practices nationwide.

Figure 3. Participants of the ERDC-SWG Demonstration Workshop on Engineering with Nature

## OUTCOMES

- Workshop participants had practical experience in onsite and offsite harvesting, planting, transplanting, plugging, soil modification, coconut log installation, and broadcast seeding techniques.
- Participants visited Texas A&M Galveston Sargassum-Dune Experimental set up, observed active dredging operations, and visited the NRG EcoCenter.
- Presentations covered introduction to EWN, biotechnical planting, coir log installation, vegetative surveys, plant selection, ecological and regulatory considerations.

Figure 1. Participants harvesting native species from NRG facility.

## BACKGROUND

- Participants include USACE ERDC, Galveston District, NOAA-National Marine Fisheries Service, United States Department of Agriculture-Natural Resources Conservation Service, Texas General Land Office, and private sector.
- The workshop consist of engineers, landscape architects, marine biologists, soil scientists, and ecologists, promoting collaboration across multiple disciplines.
- The four day workshop culminated into a session identifying projects within Galveston District where EWN practices and techniques are applicable.

Figure 5. Completed planting of dike section.

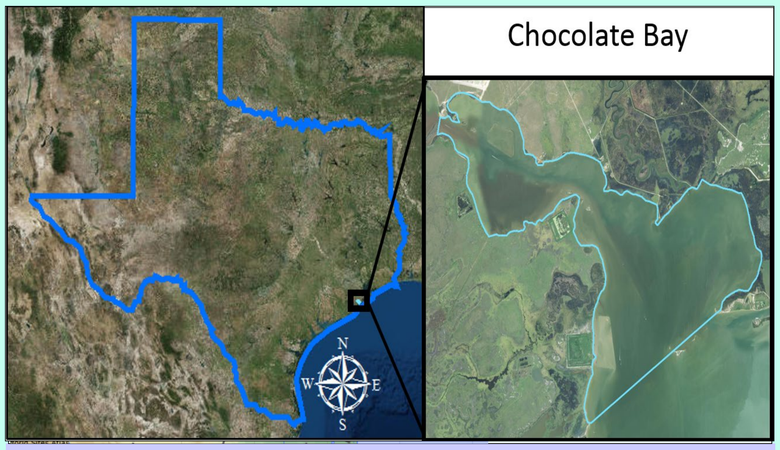


Fig 2. Map of study site with inset of Chocolate Bay.

Figure 4. Participants planting at Beneficial Use Site 4A in Brazoria County.

## NEXT STEPS

- Direct engagement with Galveston District regarding the PA-14 Erodible Berm project in Galveston Bay.
- Preparation of tech report to highlight lessons learned and benefits of demonstration workshops (FY18).
- Plan a workshop in Philadelphia District (FY18).
- Continued development of technical guidance documents promoting EWN through the establishment of native vegetation.