



U.S. ARMY

ENGINEERING WITH NATURE TO CREATE SUSTAINABLE VALUE

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Restore America's Estuaries
12 December 2018



**US Army Corps
of Engineers**

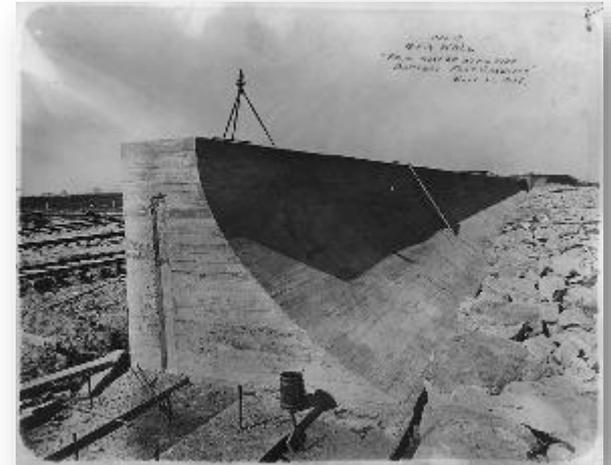


HARD LESSONS FROM THE PAST



Galveston Hurricane (1900)

- Landfall 8 September 1900
- Estimated Category 4 Hurricane
 - ▶ 145 mph winds
- Estimated death toll: 6,000-12,000
- Galveston Seawall
 - ▶ Constructed: 1902-1963
 - ▶ >10 miles long



NATURE-BASED FEATURES PERFORM DURING HURRICANE SANDY



Dune Protection on the Rockaway Peninsula

With Dune (Beach 56th Street)



Without Dune (Beach 94th Street)



<http://www.nyc.gov/html/sirr/html/report/report.shtml>

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CREATING VALUE THROUGH ALIGNMENT...

- What opportunities are there to achieve better alignment of natural and engineered systems?
 - Can improved alignment reduce risks to life, property and ecosystems?
 - What range of services can be produced through such alignment?
 - What are the science and engineering needs in order to achieve better alignment?



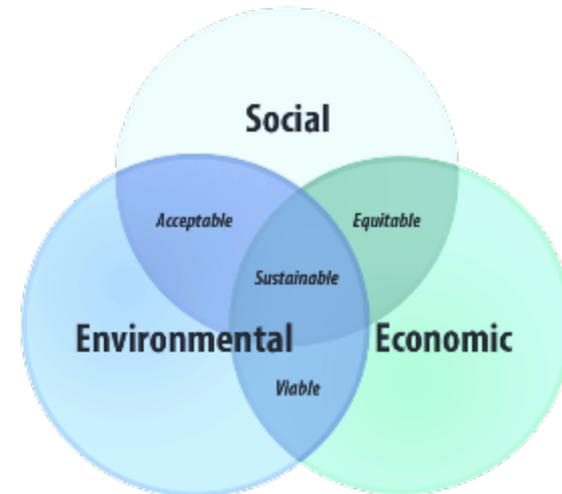
Sustainable Solutions Vision: “Contribute to the strength of the Nation through innovative and environmentally sustainable solutions to the Nation’s water resources challenges.”

Engineering With Nature®

...the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental and social benefits through collaboration.

Key Elements:

- Science and engineering that produces operational efficiencies
- Using natural process to maximum benefit
- Broaden and extend the benefits provided by projects
- Science-based collaborative processes to organize and focus interests, stakeholders, and partners



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EWN[®] OVERVIEW

Engineering With Nature[®] began in 2010

- Engaging across USACE, other agencies, NGOs, academia, private sector, international collaborators
- Guided by a strategic plan
- Established through Proving Grounds
 - Galveston, Buffalo, Philadelphia
- Informed by focused R&D
- Demonstrated with field projects
- Advanced through partnering
- Shared by strategic communications
- Marking progress
 - 2013 Chief of Engineers Environmental Award in Natural Resources Conservation
 - 2014 USACE National Award-Green Innovation
 - 2015, 2017 WEDA Awards; 2017 DPC Award



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EWN[®] ACROSS USACE MISSION SPACE

Navigation

- Strategic placement of dredged material supporting habitat development
- Habitat integrated into structures
- Enhanced Natural Recovery

Flood Risk Management

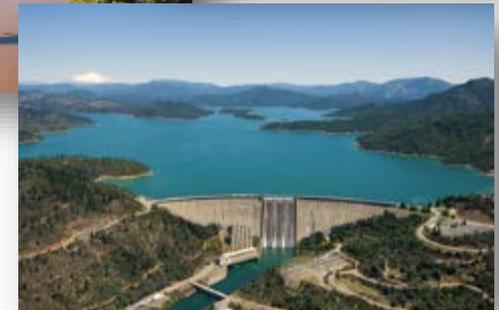
- Natural and Nature-Based Features to support FRM
- Levee setbacks

Ecosystem Restoration

- Ecosystem services supporting engineering function
- “Natural” development of designed features

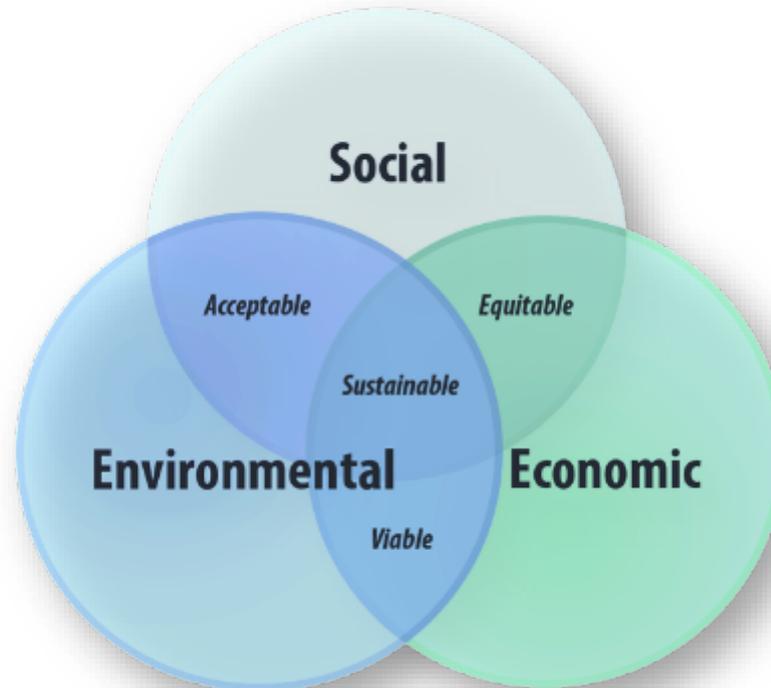
Water Operations

- Shoreline stabilization using native plants
- Environmental flows and connectivity



SUSTAINABILITY

Sustainability is achieved by efficiently investing resources to create present and future value



A “SUSTAINABILITY LEDGER” FOR SEDIMENT MANAGEMENT

Efficiency

- Reducing sedimentation in channels & reservoirs
- Reducing transport distances for dredged material
- Reducing dredging time
- Expanding operational flexibility
- Linking multiple projects
- Optimizing regulatory processes to streamline the project schedule

Value Creation

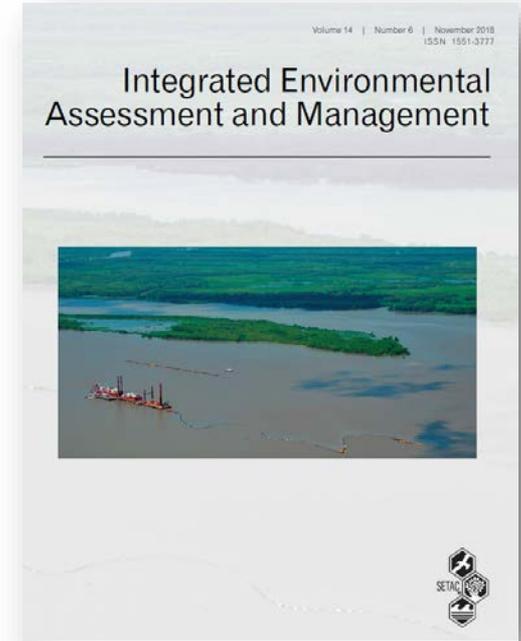
- Restoring natural sediment processes to sustain landscapes
- New nature-based features that reduce flood risks
- Budget space for additional infrastructure work
- New habitat for fish and wildlife
- New features that provide recreational and other social value

HORSESHOE BEND ISLAND, ATCHAFALAYA RIVER



Project Awards:

- 2015 WEDA Award for Environmental Excellence
- 2017 WEDA Award for CC Adaption
- 2017 DPC Award for Working, Building, and Engineering with Nature



Quantifying Wildlife and Navigation Benefits of a Dredging Beneficial-Use Project in the Lower Atchafalaya River: A Demonstration of Engineering with Nature®

Christy M Foran, † Kelly A Burks-Copes, † Jacob Berkowitz, † Jeffrey Corbino, § and Burton C Suedel** †



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COLLABORATION AND COMMUNICATION



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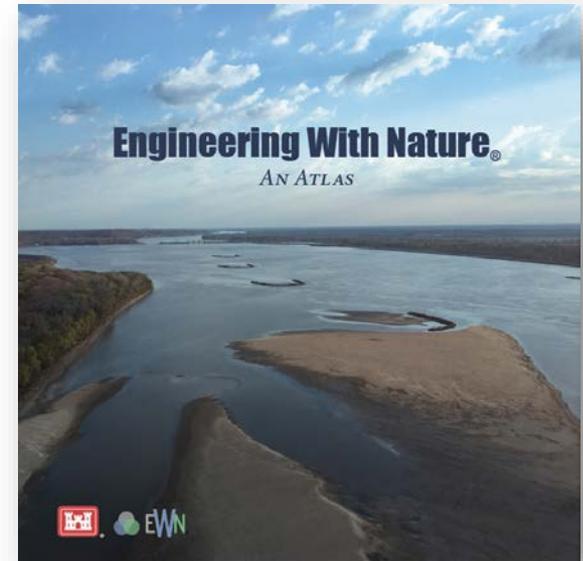
EWN ATLAS “LAUNCH EVENT”

10:30-12:00

January 16, 2019

National Building Museum
Washington, D.C.

“Engineering With Nature is an important initiative for the U.S. Army Corps of Engineers.” James Dalton, USACE Director Civil Works



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INCENTIVES

- **Public agency goals**
 - E.g., USACE establishing national goals and metrics for: 1) dredged material beneficial use, 2) Natural and Nature-Based Features
- **Private company goals**
 - E.g., Dow Chemical commits to produce \$1B in value by 2025 through nature's services and functions
- **Ports**
 - E.g., Port of Huelva 20% discount in concession fees in exchange for a commitment to environmental improvement
- **Regulatory programs**
 - E.g., USACE national / regional permits for living shorelines / nature-based solutions
 - Reduced mitigation requirements
- **Cost-sharing**
 - E.g., public-public and public-private partnerships, e.g., USACE-NOAA, USACE-USFWS; USACE-TNC

