

# Natural Infrastructure: A Smart Investment



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The Nature  
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# Natural Infrastructure: A Smart Investment

Engineering With Nature<sup>®</sup>  
to Develop  
Natural Infrastructure



Dr. Todd S. Bridges, USACE Senior Research Scientist



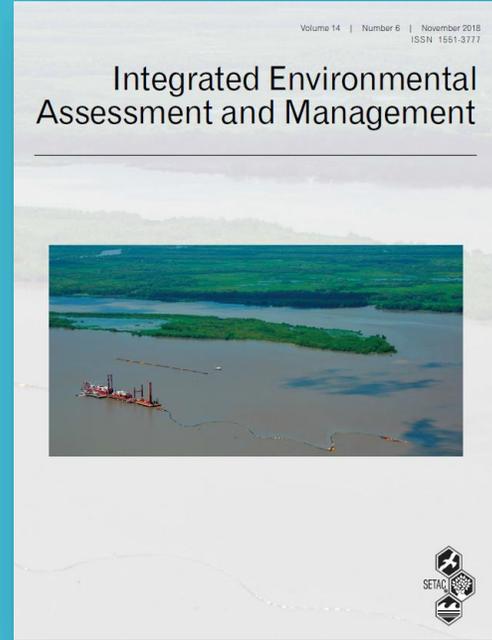
# What is Natural Infrastructure?

**Natural Infrastructure: A natural or nature-based process, feature, or system that provides functions or services that support engineering goals.**

- An island that reduces waves and storm surge
- A flood plain that provides flood storage capacity
- A wetland that removes nutrients from run-off
- A plant community that supports the structural integrity of a dune or levee
- Etc.



# Horseshoe Bend Island, Atchafalaya River, LA



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

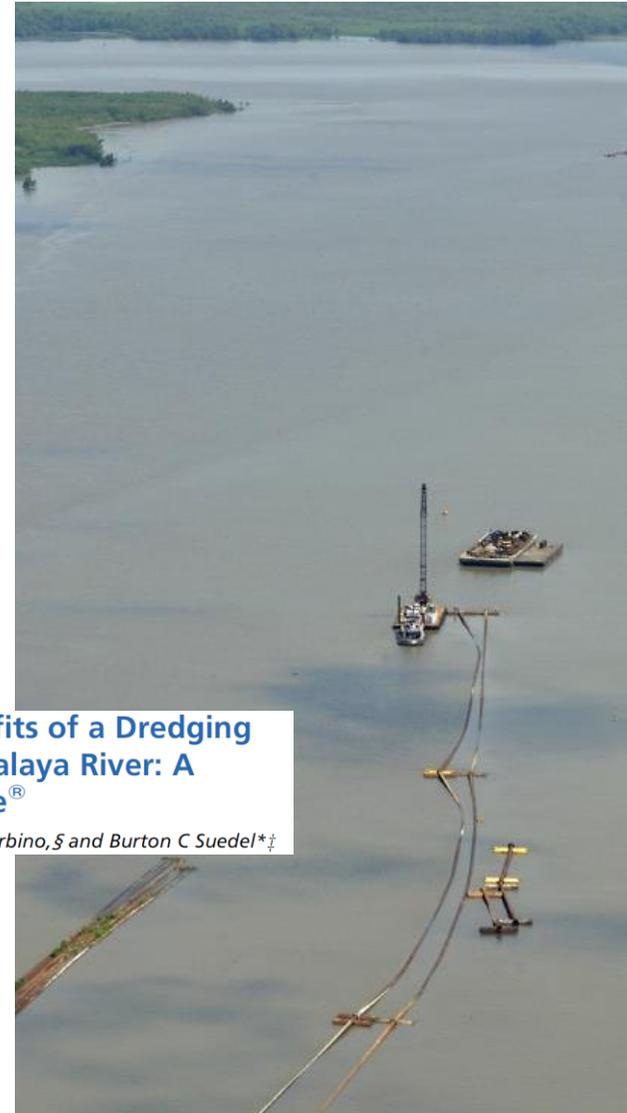
Christy M Foran,<sup>†</sup> Kelly A Burks-Copes,<sup>‡</sup> Jacob Berkowitz,<sup>‡</sup> Jeffrey Corbino,<sup>§</sup> and Burton C Suedel<sup>\*‡</sup>

### Project Awards:

2015 WEDA Award for Environmental Excellence

2017 WEDA Award for CC Adaption

2017 DPC Award for Working, Building, and Engineering with Nature



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# Coastal Wetlands

## What value did coastal wetlands provide during Hurricane Sandy?

- Insurance industry models and tools used to quantify the economic benefits in terms of avoided damages
- Results:
  - Coastal wetlands provided \$625 million in avoided damages
  - In Ocean City, NJ: salt marsh conservation could reduce annual flood damages by more than 20%



### COASTAL WETLANDS AND FLOOD DAMAGE REDUCTION

Using Risk Industry-based Models  
to Assess Natural Defenses in the Northeastern USA

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# International Examples

Scheldt River, Belgium



Alkborough, UK



Noordwaard, The Netherlands

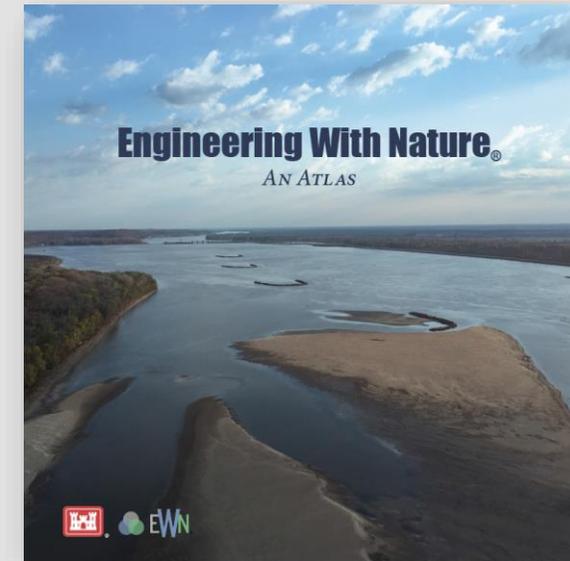
# Engineering With Nature®



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 collaboration to organize and focus interests, stakeholders, and partners



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\*Among many others

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