



Managing Shorelines and Resilience Using EWN: Case Studies



Presented by:

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Why Engineering with Nature (EWN)?

- Why not?
- How is it different from traditional coastal management?
- One size doesn't fit all projects!



Process-Oriented Approach



Water levels
Wave energy
Sediment transport

Shorelines are interconnected, complex systems, and require a holistic management approach



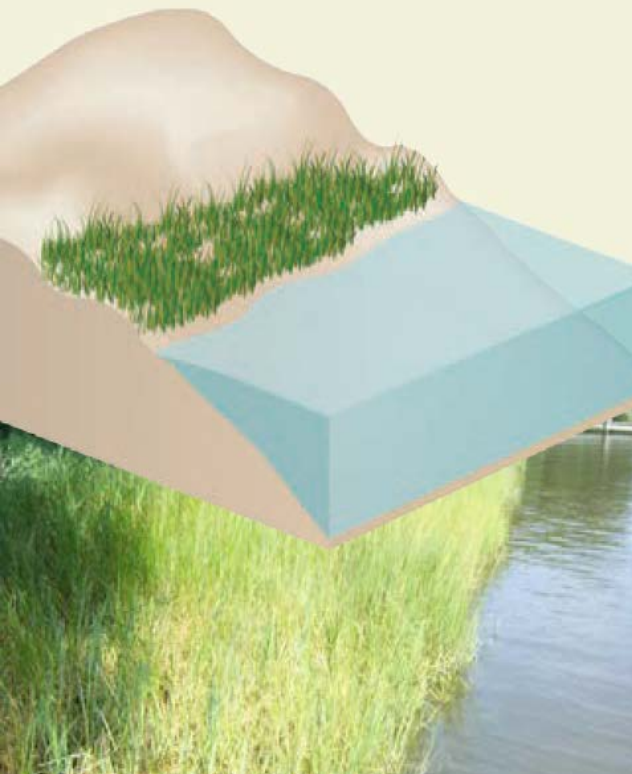
Beach profile
Sediment grain size
Seasonal variations



Soft restoration
Ecological benefits
Food web support

EWN Options for Shoreline Management

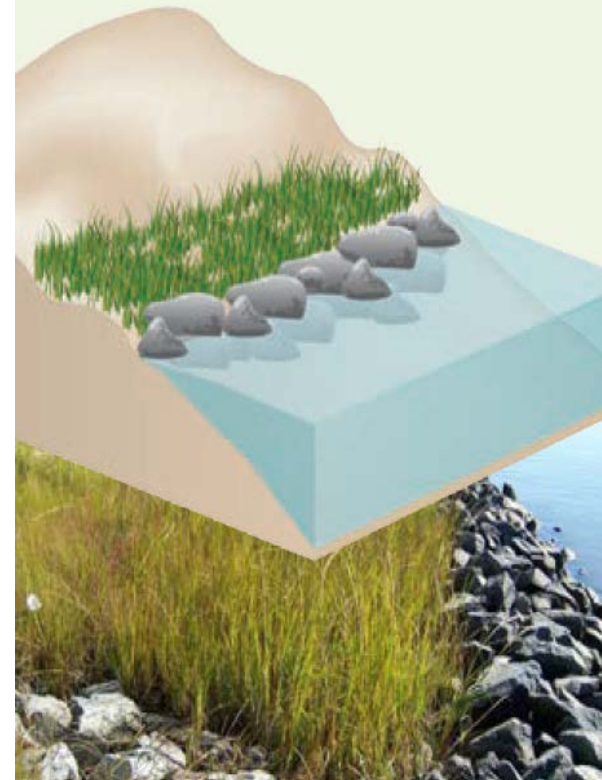
VEGETATION
ONLY



EDGING



SILLS



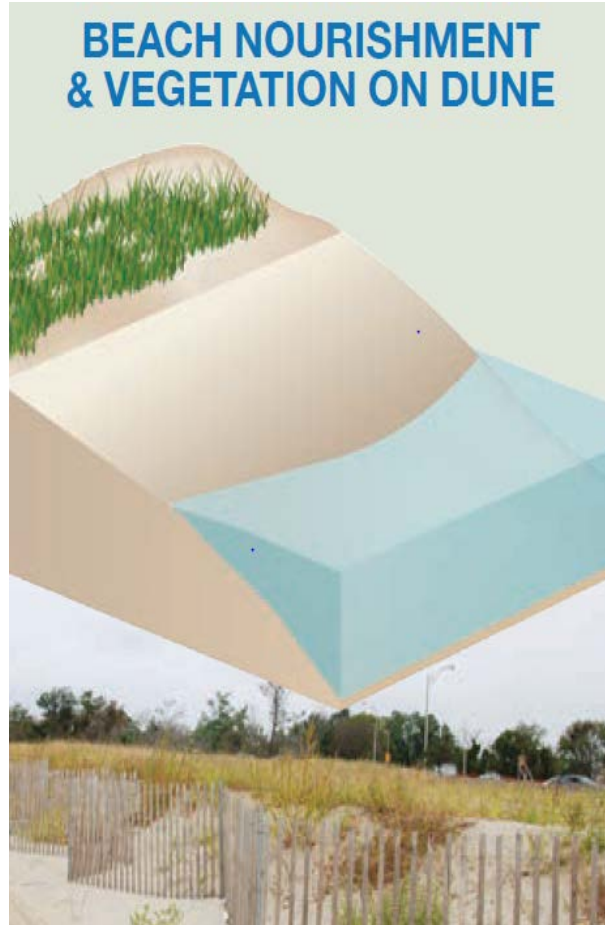
<http://sagecoast.org>

EWN Options for Shoreline Management (Cont'd)

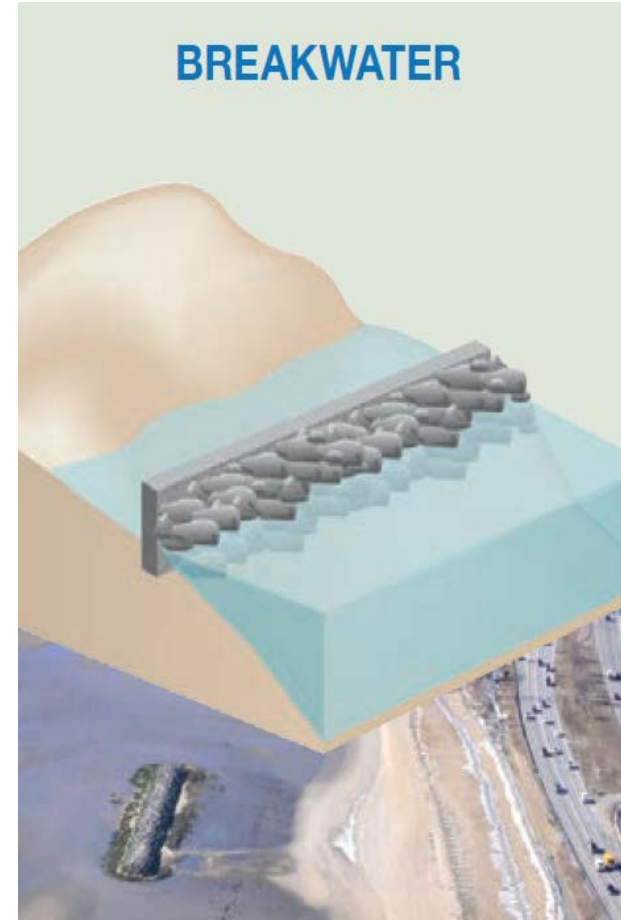
**BEACH NOURISHMENT
ONLY**



**BEACH NOURISHMENT
& VEGETATION ON DUNE**



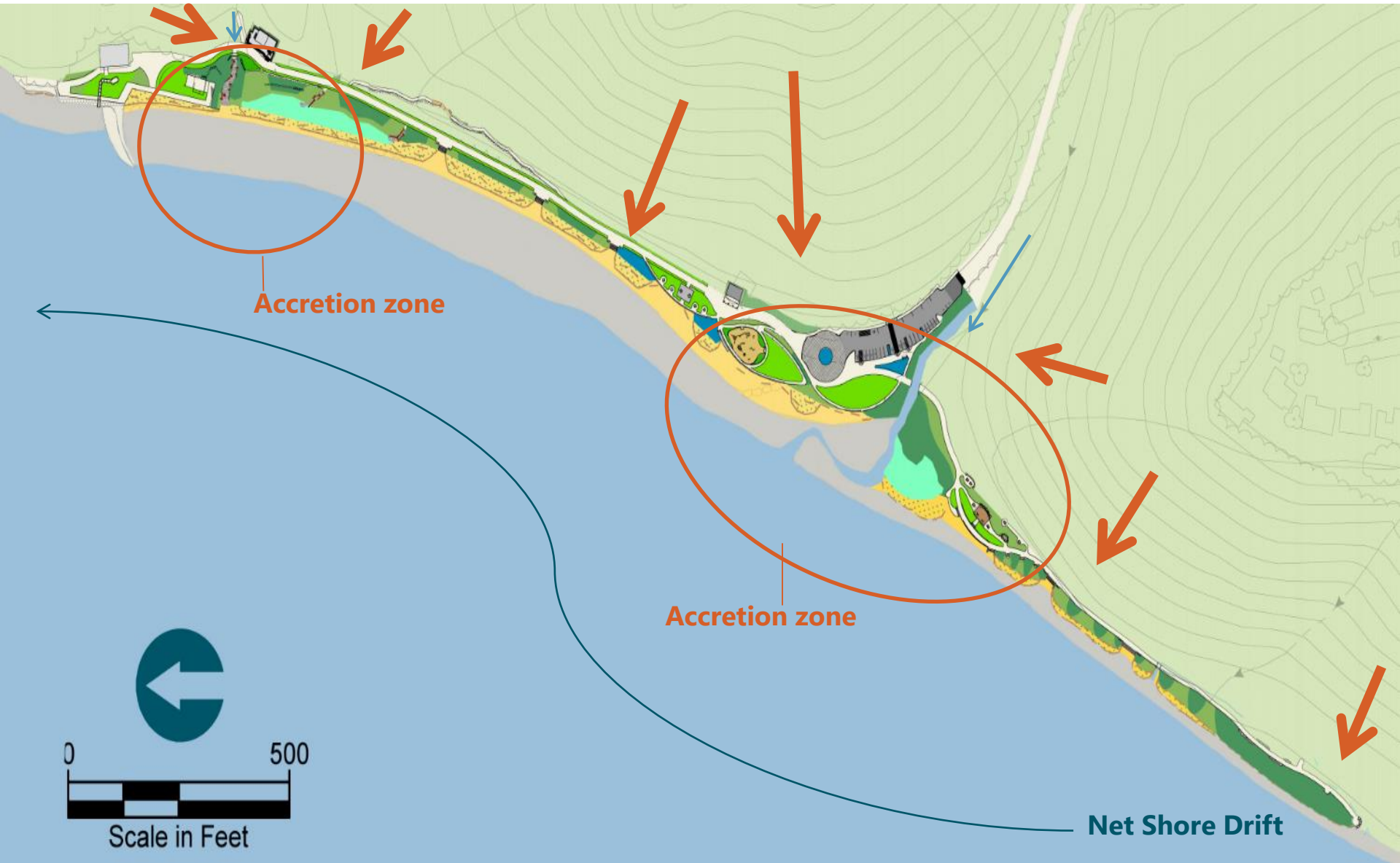
BREAKWATER



<http://sagecoast.org>

Seahurst Park (WA) - Process Based Restoration

USACE/City of Burien (WA)/Anchor QEA



Seahurst Park, Phase 2-North Shoreline

Before Project



Onondaga Lake Shoreline Restoration (NY)

Honeywell/Parsons/OBG/Anchor QEA



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Lakeshore Habitat Restoration



August 2018

September 2017



Chocolate Bayou, Texas

U.S. Army Corps of Engineers, Galveston



Construction of
Beneficial Use Sites



Galveston District – Custodians of the Coast



Neches River (Bessie Heights Marsh), Texas

U.S. Army Corps of Engineers, Galveston



Marsh Creation

Channels form shortly after pumping of dredged material into open water area



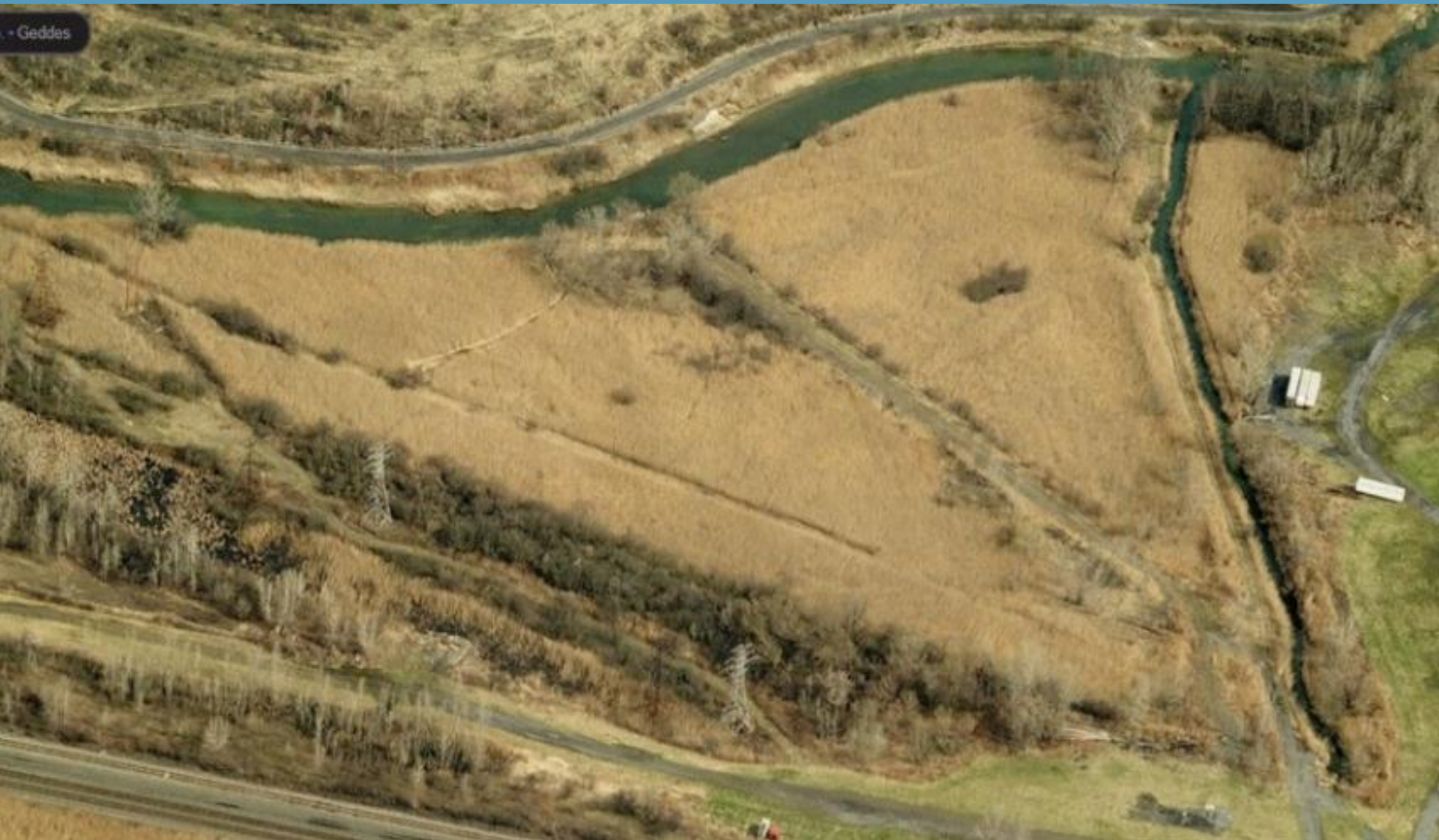
Established 28 acres of marsh one year later

Galveston District – Custodians of the Coast

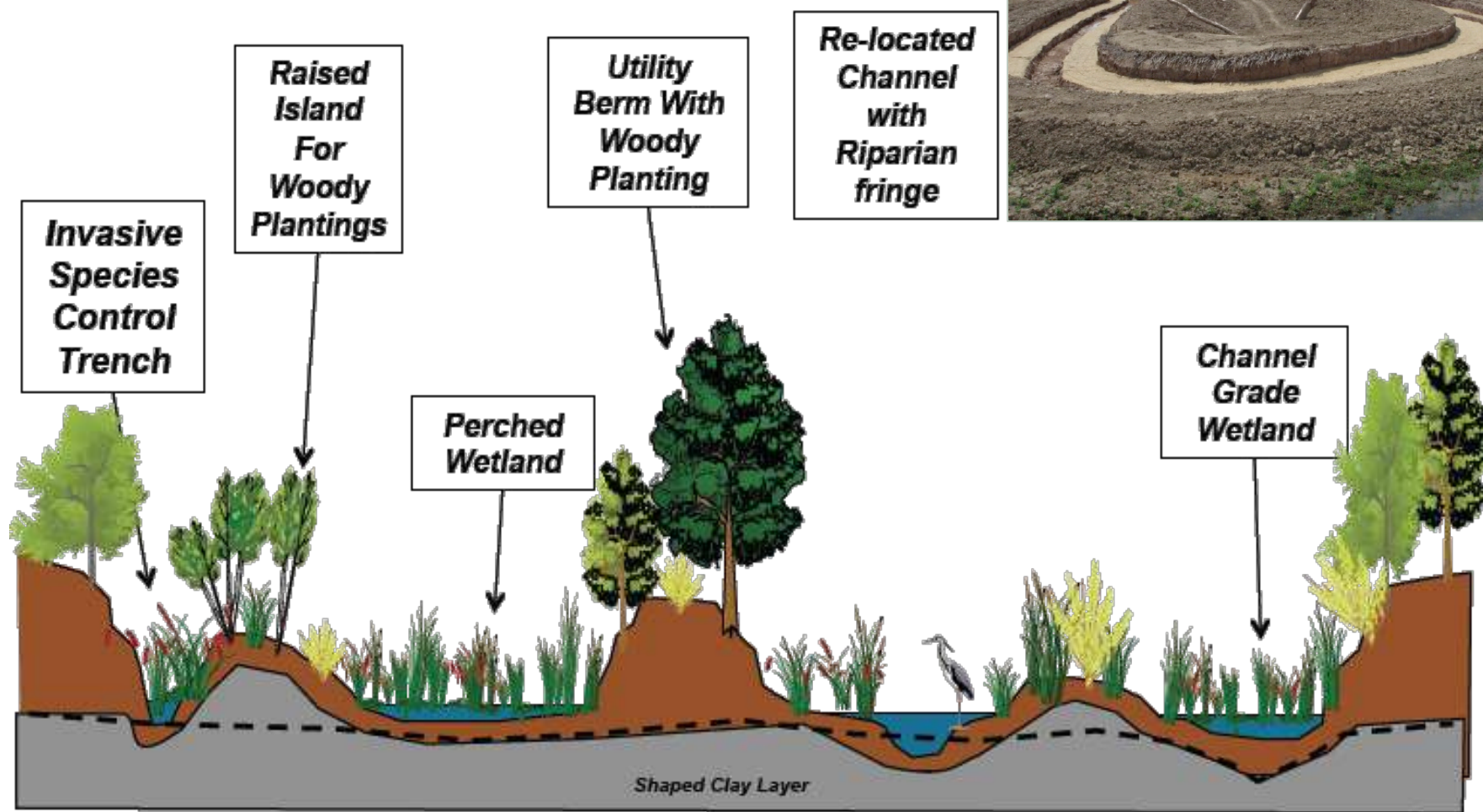


Geddes Brook (NY): Pre-Project

Honeywell/Parsons/Anchor QEA



Restoration – Cross Section



Restored Brook over Time

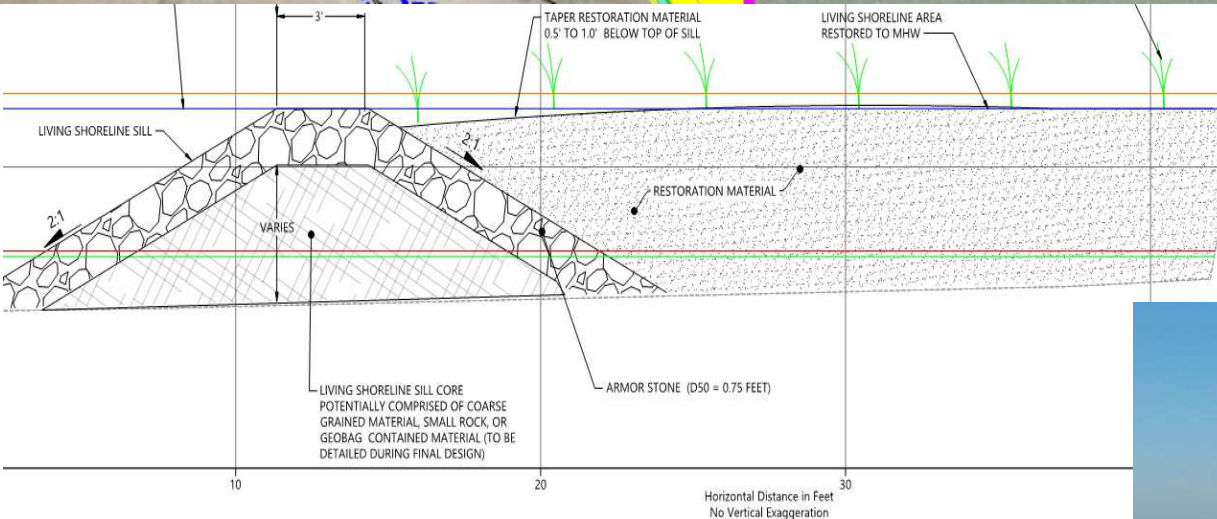
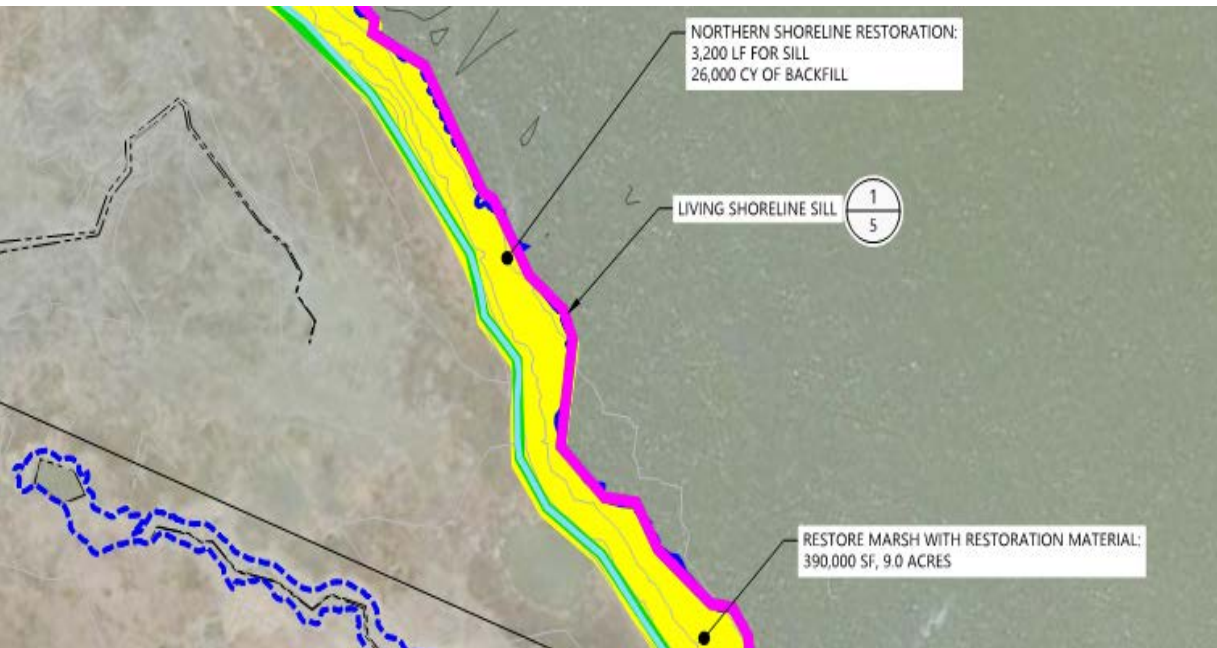


Shooting Island (NJ) - Historical Shoreline

OCNJ/NFWF/ACT/Anchor QEA



Living Shoreline & Oyster Habitats



Deer Island (MS)

MS Dept. of Marine Resources/Anchor QEA





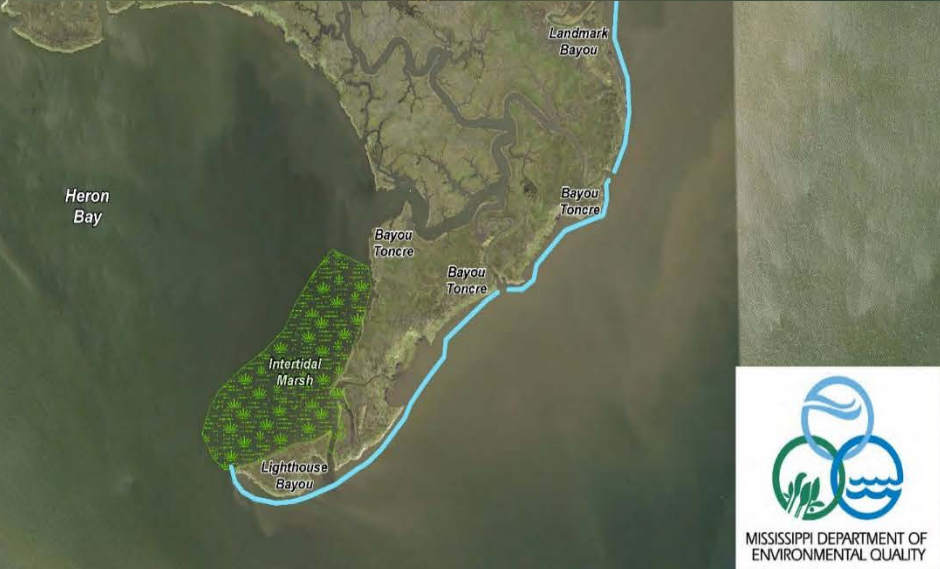
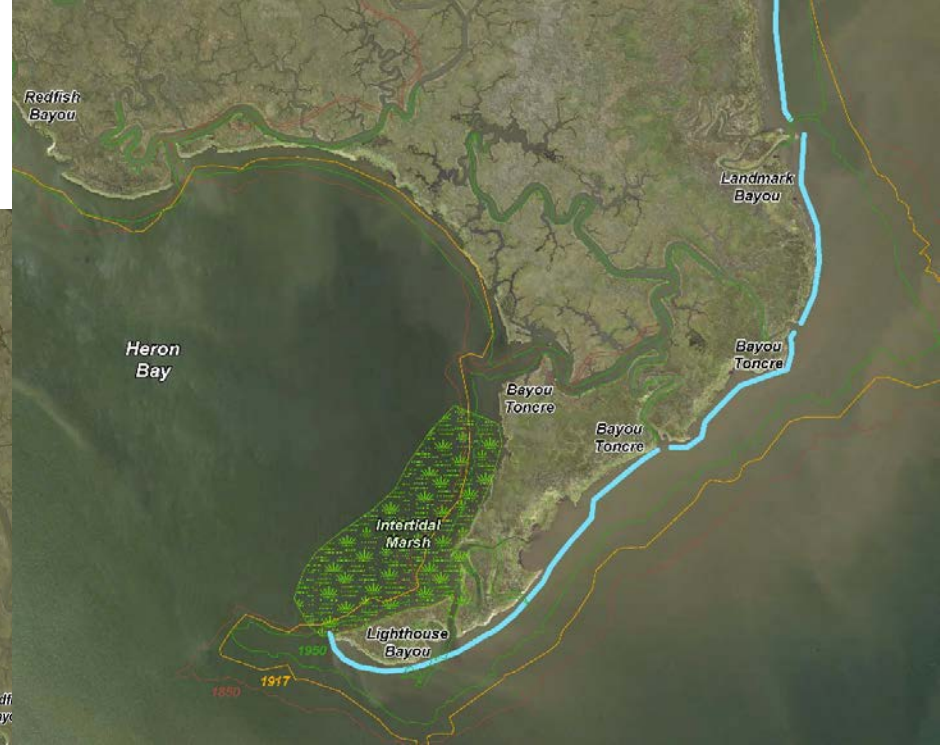
Post-Katrina (2005)



Restoration Plan

Hancock County (MS)

MS DEQ/Anchor QEA



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MISSISSIPPI DEPARTMENT OF
ENVIRONMENTAL QUALITY

Construction



Buffalo River Shoreline Restoration (NY)

Buffalo-Niagara Water Keeper/Anchor QEA



Floating Breakwater



Anchored Rootwad Logs



Wood-based Cribbing

HISTORIC PORT OF LORAIN

HOW HARD INFRASTRUCTURE CHANGED BATHYMETRY

- Change of bathymetry caused by extension of breakwall and/or dredged harbor
- No major changes in lake shoreline.



Healthy Port Futures (Great Lakes) –
Cornell/UPENN/OEPA/Anchor QEA

Healthy Port Futures (Great Lakes) – Cornell/UPENN/OEPA/Anchor QEA

Site A Concept



Site B Concept

Conclusions

- *Think innovatively, but do no harm!*
- *Integrate designs with natural features when site conditions permit*
 - *Offshore mounds for natural nourishment?*
 - *Anchored root-wads as dune cores?*
 - *Tree trunk-based groins and breakwater?*
 - *Other ways to innovate naturally?*
- *Minimize maintenance when feasible*
- *Monitor & learn (adaptive management)*



Questions?



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