

# ENGINEERING COASTAL STRUCTURES TO CENTRALLY EMBRACE BIODIVERSITY

#### THE NETWORK FOR ENGINEERING WITH NATURE

Innovative EWN Technologies and Practices in Coastal Systems Session Chair: Jeff King USACE/ERDC EWN and Landscape Architecture (25 min)

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## The Network for Engineering with Nature (N-EWN)

UGA, the U.S. Army Corps of Engineers and others have partnered together to provide cutting-edge research and community outreach to enhance community resilience.











## **Founding Partners**













Example of UGA departments involved in the Institute for Resilient Infrastructure Systems (IRIS). (more departments are involved than the three represented here)

#### **Partners**

- Academic institutions
- Research centers
- Government agencies
- Practitioners

#### **Stakeholders**

- Private industry
- Agency practitioners
- Engineering consultants

#### **Collaborators**

- Universities & researchers
- Students
- Non-profit sector



## Landscape Architect's Role

Landscape architecture involves the planning, design, management, and nurturing of the built and natural environments. With their unique skill set, landscape architects work to improve human and environmental health in all communities. They plan and design parks, campuses, streetscapes, trails, plazas, residences, and other projects that strengthen communities. -American Society of Landscape Architects

Natural and conventional infrastructure working together for thriving communities, businesses and natural systems. - Institute for Resilient Infrastructure Systems Vision





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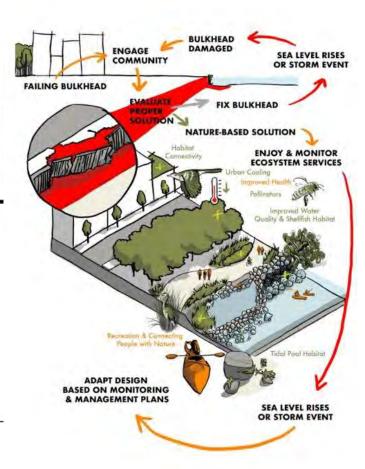
#### Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman

#### Discussion

#### Engineering coastal structures to centrally embrace biodiversity\*

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## What the literature says about the benefits of Landscape Architectural visualizations...

- Visualizations + site scale projects are powerful (Sheppard, 2015)
- Increase understanding of complex systems (Sheppard, 2015; Schroth et al. 2015)
- Landscape architects possess unique skills (Sheppard, 2015)
- The need to make graphics accessible toolkits for public officials visuals were helpful to understanding and were used by participants after the open house (Schroth et al. 2015)
- Visuals and modes of communication should cater to specific audiences (Schroth et al. 2015)



#### Tidal Gate



Tidal gate reduces reverse flow from entering culvert system.



Graphics by E. Hair, 2022.



### **Enhanced Tidal Gate**



The tide gate regulates water level to reduce flooding and improve marsh habitat.

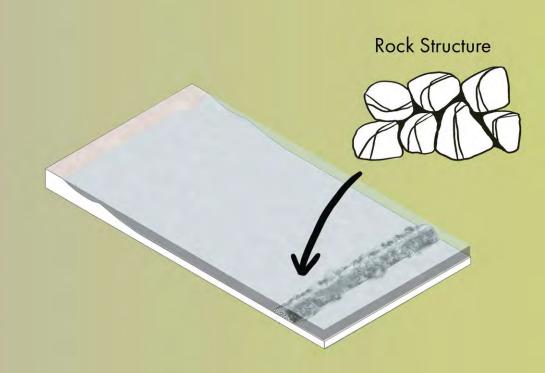


Graphics by E. Hair, 2022.



#### Breakwater

Breakwater reefs mitigate the force of waves on the shoreline by "breaking" the waves.

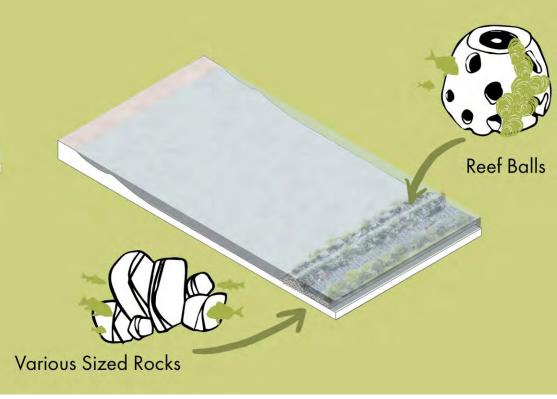


Graphics by E. Dolatowski and K. Broich, 2022.



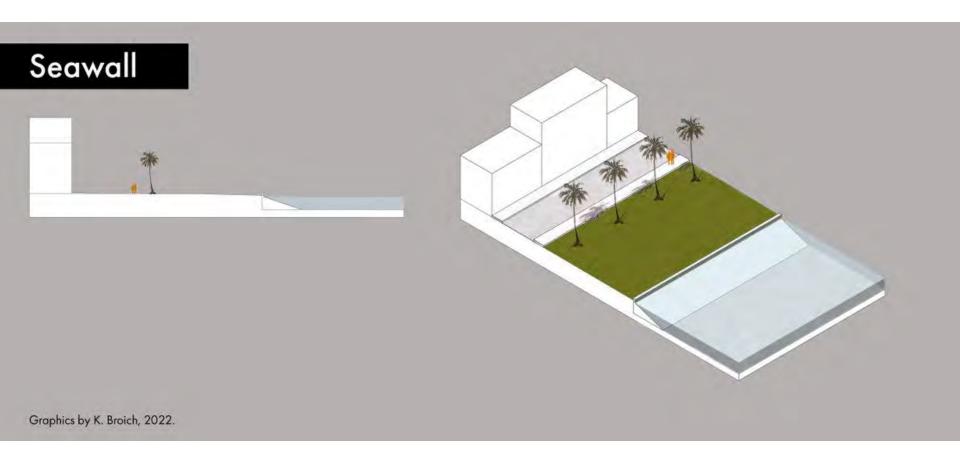
#### Breakwater Reef

Reef balls and varying sizes of rock provide habitat and protection for smaller organisms.

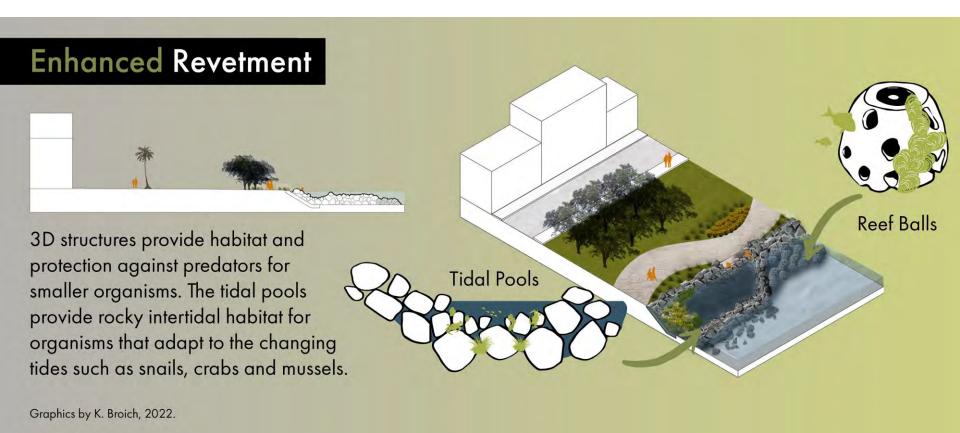


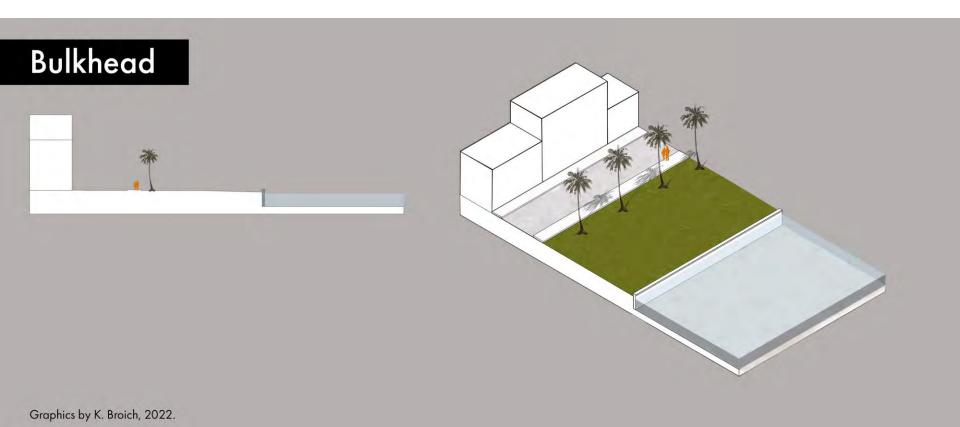
Graphics by K. Broich and E. Dolatowski, 2022.



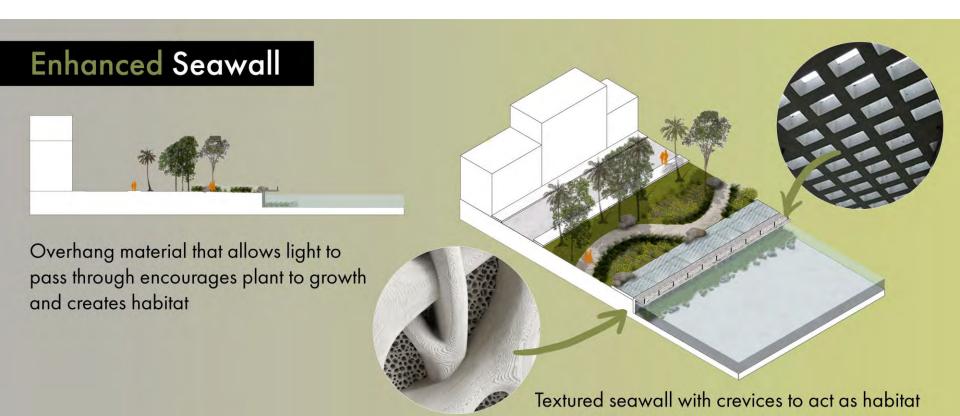






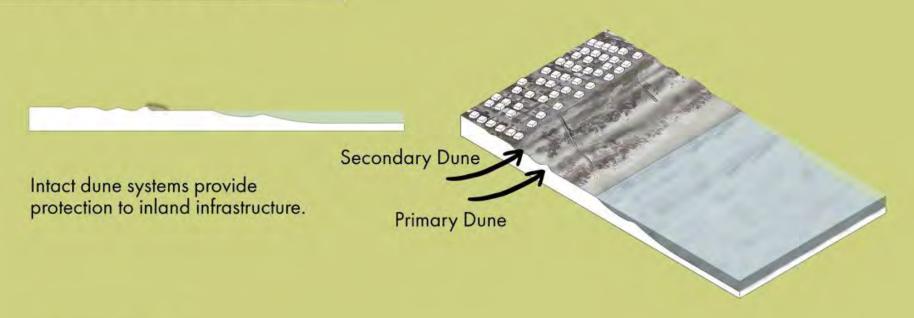








#### **Dune Restoration**



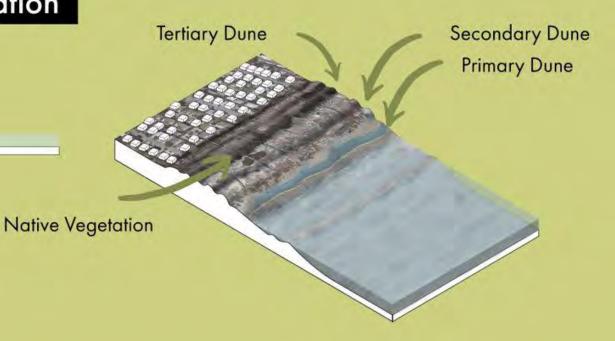
Graphics by K. Broich, 2022.



#### **Enhanced Dune Restoration**



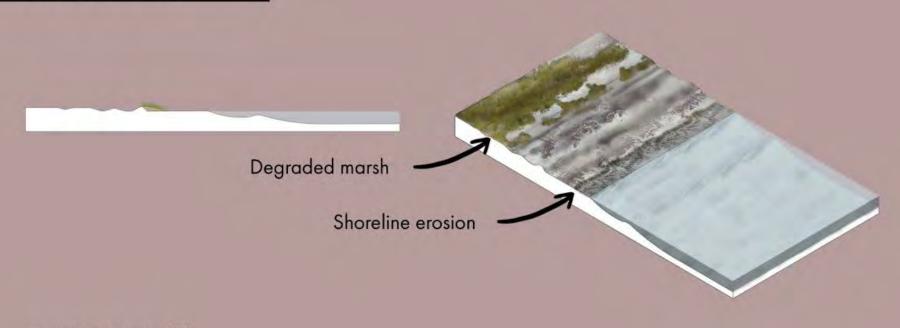
Intact dune systems provide protection to inland infrastructure.



Graphics by K. Broich, 2022.



#### **Habitat Loss**



Graphics by E. Dolatowski, 2022.



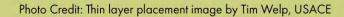
#### Thin Layer Placement



Thin layer placement spreads a thin layer of dredge material over a marsh (10 cm depth) to raise its elevation.

New Vegetation Growth

Elevated Marsh Platform



Graphics by E. Dolatowski, 2022.

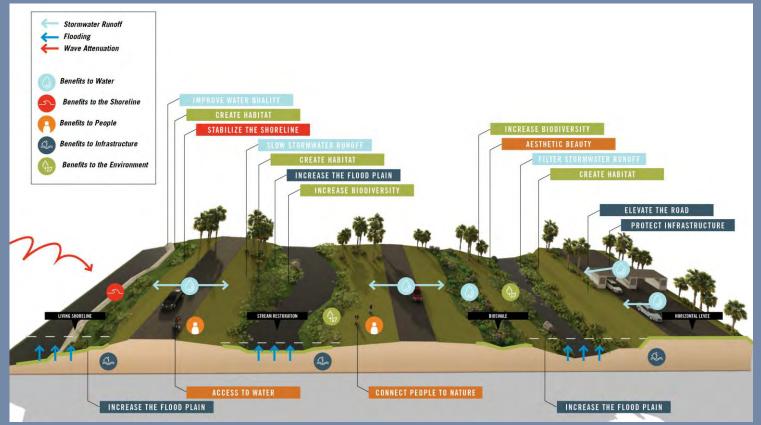




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#### MAYPORT & BEAUFORT GREEN INFRASTRUCTURE









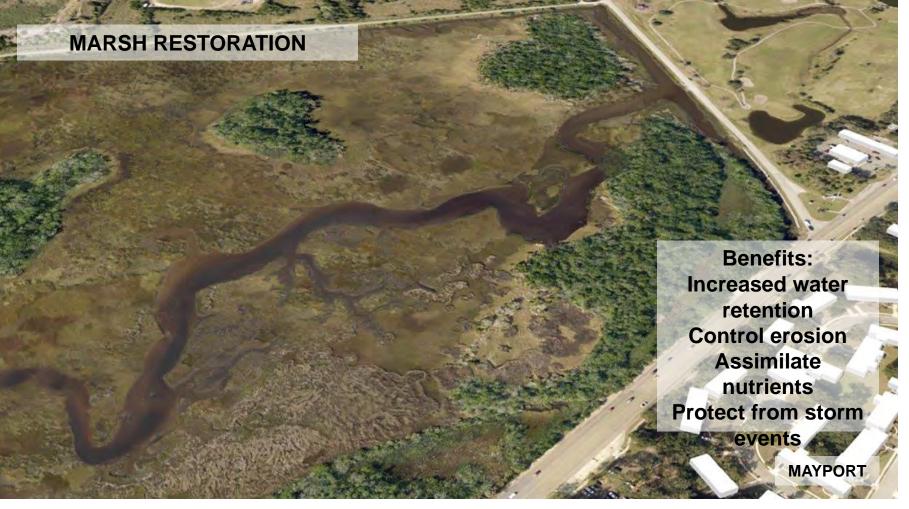














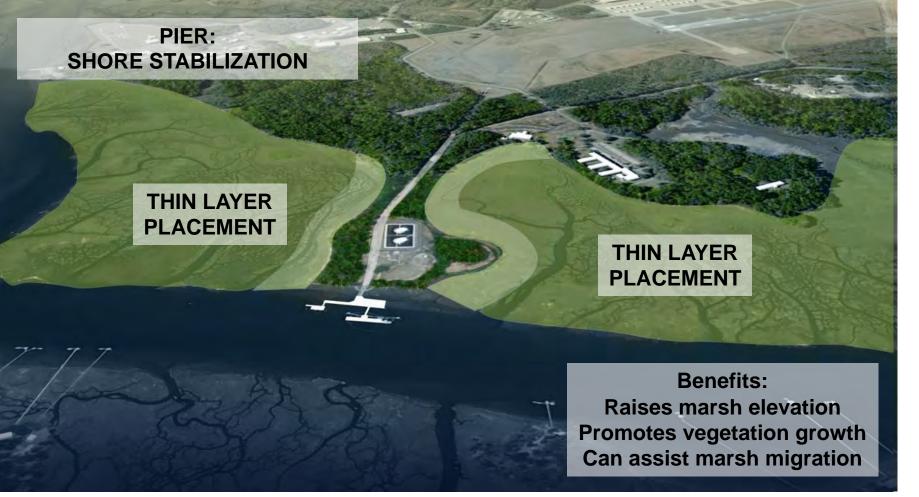












#### StoryMap Development



https://arcg.is/1Gi04e

#### **Engineering with Biodiversity**

Engineering Coastal Structures to Centrally Embrace Biodiversity







## THANK YOU

**QUESTIONS?** 











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#### **Engineering with Biodiversity**

Engineering Coastal Structures to Centrally Embrace Biodiversity







## THANK YOU

**QUESTIONS?** 

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