



Read ▾

Features ▾

Use Cases ▾

Learn ▾

Pricing

Log in

Sign up

4 MINUTE READ

Goldbug Living Shoreline



from **Engineering With Nature: An Atlas, Volume 2.**

by US Army Engineer Research and Development Center



Sullivan' s Island, South Carolina, United States

Protecting salt marshes with a living oyster reef. Goldbug Island sits on the eastern side of the Charleston Harbor, along the Atlantic Intracoastal Waterway. Wave energy from recreational boat traffic had exacerbated erosion of the local salt marsh, already affected by coastal development and sea level rise. So in 2016, The Nature Conservancy in South Carolina installed an Oyster Castle reef, the longest reef the group had established in the state. The 67-meter-long reef reduces wave energy, promotes oyster growth, and advances the front edge of the *Spartina alterniflora* marsh grass. The installation was one part of a larger, multiyear project funded by the Wildlife Conservation Society's Climate Adaptation Fund to install demonstration projects that serve as a learning platform while the state develops a living shoreline permitting process for private property owners. The Conservancy organized three different volunteer days to prepare and install the materials, receiving assistance from South Carolina Department of Natural Resources staff and over 200 volunteers from the community. Volunteers continue to monitor its progress, reporting sitings of numerous species using the reef, including commercially important fish species.

Article cover: Nearly 200 volunteers helped install the shoreline in April 2016. (Photo by South Carolina The Nature Conservancy [SCTNC])

Producing Efficiencies

CH2M designed the living shoreline reef for The Nature Conservancy. The reef structure reduces wave energy from boat wakes and promotes sediment accretion on the landward side of the reef. The presence of soft, watery mud might have made for a difficult and expensive installation, but the team used pallets as a base layer and wrapped them in geotextile fabric to “float” in the mud. These pallets, combined with Oyster Castles and dried, bagged oyster shells, will stay within the water column and remain available for future spat to settle.



Volunteers from The Citadel and the local community line up walking boards
(Photo by SCTNC)

Using Natural Processes

Besides preventing erosion and promoting sediment accretion, oyster reefs support over 130 aquatic species. They provide interstitial spaces for juvenile and small species to find protection; feeding grounds for larger species; and plentiful surfaces for oysters, which then support future populations of oysters in the local waterways by producing seed. Oysters are filter feeders, filtering up to 190 liters of water per day, so this reef will also provide cleaner water and reduced turbidity, while the growing marsh behind it will provide new habitat for local and migratory birds.



Monitoring oysters showed 7.6 centimeters of growth after the first year.

(Photo by SCTNC)

Broadening Benefits

South Carolina still has one of the largest wild oyster harvest industries in the region, so protecting current populations and seeding new ones directly benefits the South Carolina economy. But oyster reefs also save \$750 per meter on coastline protection, diffusing wave energy from storm surges and reducing the risk of flooding from coastal storms. Oyster reefs

play an important role in filtering water and sequestering greenhouse gases, and they support a resilient coastal ecosystem. Additionally, this living shoreline project provides an educational opportunity and a highly visible example of the benefits of nature-based shoreline stabilization.



Preinstall site visit reveals erosion to the salt marsh, August 2014.

(Photo by SCTNC)



The natural salt marsh vegetation is recovering due to shoreline stabilization, July 2019.

(Photo by SCTNC)

Promoting Collaboration

The Nature Conservancy worked with Lowcountry Land Trust, which holds a conservation easement on Goldbug Island, in hopes that the conservation easement would help prevent future coastal property development on the island, promoting the longterm stability of the project. The property owners, East Cooper Outboard Motor Club, agreed to allow property access to the Conservancy for five years to install and monitor the living shoreline project. CH2M and the South Carolina Department of Natural Resources were also partners on the project, bringing shoreline reef design experience and sediment accretion and analysis expertise.



Post-Hurricane Dorian site check reveals resiliency of the project site, September 2019.

(Photo by SCTNC)



More articles from this publication:



Introduction

13min pages 19-29



Conclusion

5min pages 320-325

**Coastal Resilience and Natural Solutions Toolkits**

2min pages 310, 318-319

**Coastal Storm Modeling System**

2min pages 310, 316-317

**Natural Infrastructure Opportunities Tool**

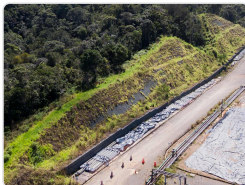
2min pages 310, 314-315

**Ecosystem Services Identification and Inventory**

2min pages 310, 312-313

**Cypress Reforestation**

4min pages 306-309

**Matarandiba Island**

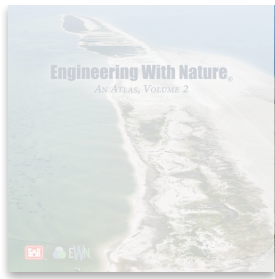
3min pages 302-305

**Lower Yellowstone River Fish Passage**

4min pages 298-301

[Show more](#)

This article is from:



[Engineering With Nature: An Atlas, Volume 2.](#)

by [US Army Engineer Research and Develop...](#)



Issuu Inc.

Create once,
share everywhere.

Issuu turns PDFs and other files into interactive flipbooks and engaging content for every channel.

 English 

Company

[About us](#)

[Careers](#)

[Plans & Pricing](#)

[Press](#)

[Blog](#)

[Contact](#)

Resources

[Developers](#)

[Elite Customer Program](#)

[Publisher Directory](#)

[Redeem Code](#)

Issuu Platform

[Content Types](#)

[Features](#)

[Flipbook](#)

[Industries](#)

