

3 MINUTE READ

Swift Tract Oyster Reef Breakwaters



from **Engineering With Nature: An Atlas, Volume 1.**

by **US Army Engineer Research and Development Center**



Bon Secour National Wildlife Refuge, Baldwin County, Alabama, United States

The Swift Tract site is located along an actively eroding vegetated shoreline owned by the State of Alabama and managed through the Weeks Bay National Estuarine Research Reserve. At about 5 miles in length, this shoreline represents one of the longest continuous stretches of undeveloped shoreline in Mobile Bay. Erosion rates in this area were estimated to be at approximately 1 foot/year, according to historical imagery. In an effort to reduce wave energies and help slow the rate of erosion, oyster reef breakwaters were constructed by The Nature Conservancy (TNC) in 2012, using Hesco barriers, which are galvanized steel modular baskets. The barriers were installed, then filled with gabion stone; a six-inch layer of oyster shell was placed over the top, then along the front and rear sides. The total Swift Tract reef breakwater measures 1,860 feet (567 meters) and includes five individual reef segments. Pre- and post-construction monitoring parameters included oyster settlement, depth profiles, and shoreline position.

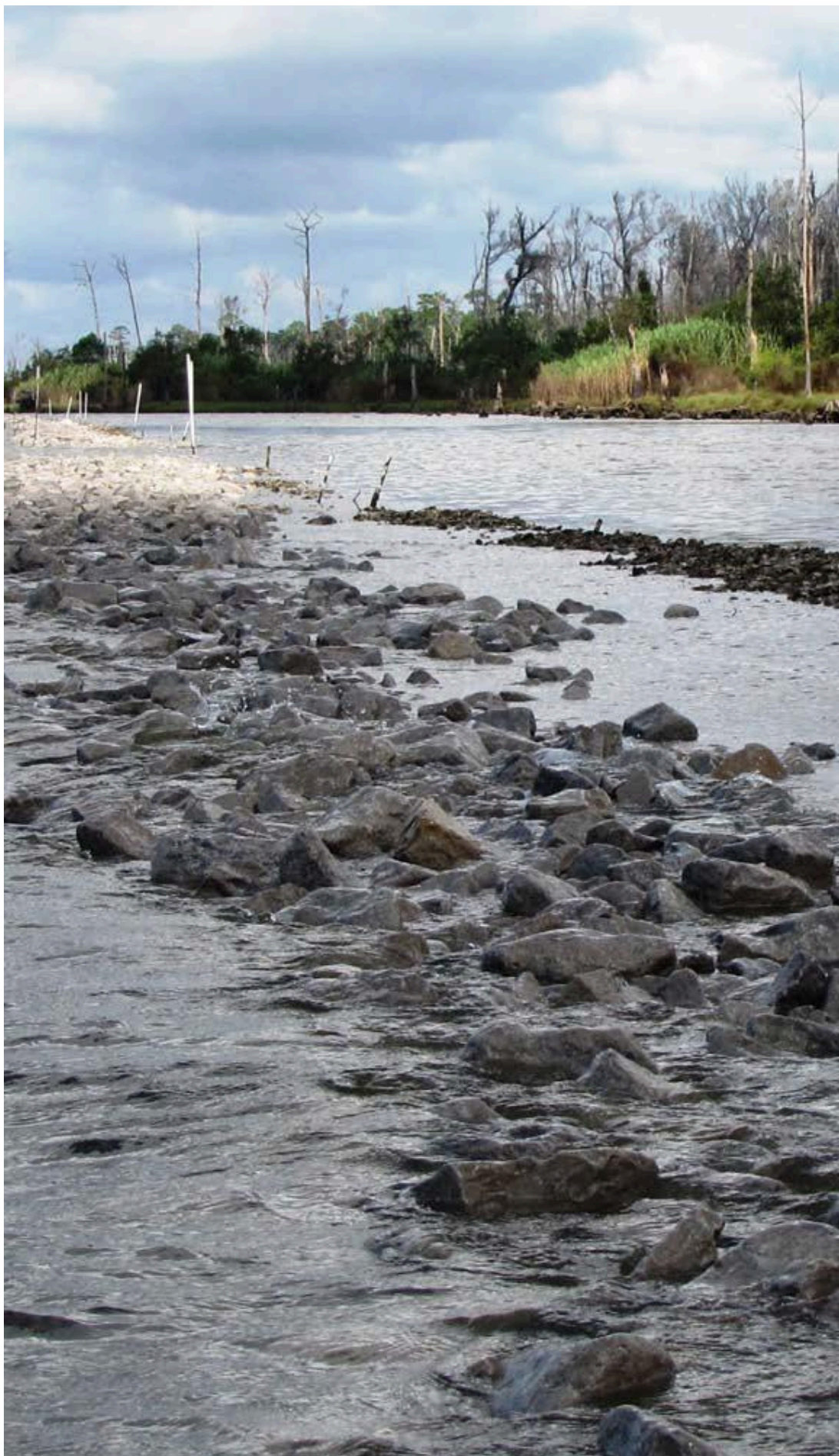
Article cover: Swift Tract aerial photo. (Photo by Joe Bay Aerials)

Producing Efficiencies

The use of Hesco barriers was an innovative approach to breakwater construction. The breakwater dimensions were engineered for this specific location to ensure the breakwaters were large enough to reduce wave energy and provide habitat for oyster settlement, but were not oversized, which could unnecessarily disrupt natural processes and increase costs. The layer of oyster shell on top of the rocks provided the preferred material for oysters to settle upon but reduced the volume of oyster shell—an expensive and limited resource—required for the project.

Using Natural Processes

Natural processes were used to maximize benefits by creating a living shoreline that uses more natural bank stabilization techniques to maintain valuable habitat. The oyster reef breakwaters were constructed with a layer of oyster shells to reduce shoreline erosion, protect salt marsh habitat, and restore ecosystem diversity and productivity in Mobile Bay. The breakwaters are expected over time to develop into reefs, providing added reproductive and foraging habitat and shelter from predators.



Oyster reef breakwaters protecting the salt marsh habitat.

(Photo by Mary Kate Brown, The Nature Conservancy)

Broadening Benefits

This living shoreline project offers multiple additional benefits when compared to traditional bank stabilization techniques. The oyster reef breakwater reduces shoreline erosion, protects salt marsh habitat, and restores ecosystem diversity and productivity. Protecting the salt marsh and increasing the cover of reef habitat protects a rich source of food for shrimp, crabs, and sport fishes such as red drum, which feast on organisms that are abundant in salt marshes and reefs. Reef construction and associated activities has also injected millions of dollars into the area and created numerous jobs.



Breakwaters attenuating waves at Swift Tract.

(Photo by Mary Beth Charles, The Nature Conservancy)

Promoting Collaboration

TNC collaborated with partners from the Alabama Department of Conservation and Natural Resources and the Weeks Bay National Estuarine Research Reserve to create a project that would help protect and restore the state's natural resources. This collaboration also included outreach and

education activities to inform the public about the benefits of habitat restoration projects.



A great blue heron forages behind the reefs.

(Photo by Mary Kate Brown, The Nature Conservancy)



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