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MacDill Oyster Reef Shoreline Stabilization



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

by US Army Engineer Research and Development Center



Tampa, Florida, United States

The MacDill Air Force Base (AFB) Oyster Reef Shoreline Stabilization Project demonstrates Engineering With Nature at work. This project, which was a collaborative effort between MacDill AFB and Tampa Bay Watch, was developed to provide an alternative to “hardened” shorelines and uses marine-friendly materials to create a living system that restores natural stabilizers. The creation of near-shore oyster reefs reduces wave energy, encourages sediment accumulation, and restores the natural coastal vegetation that traditionally protected the shoreline from erosion. The project offers three principle benefits, including shoreline stabilization, water quality improvement, and habitat enhancement. This project was executed in five phases beginning in 2004 and concluding in 2012, and won the Future of the Region Award for Natural Resources and Environment in 2014.

Article cover: The near-shore oyster reef installed along the southeastern corner of MacDill AFB before 2008 allowed salt marsh to establish and fully stabilize the site by 2015. (Photo by Jason Kirkpatrick, MacDill AFB Environmental Office)

Producing Efficiencies

In response to increased erosion along the shoreline, marine-friendly materials small enough to be installed by hand were placed within the intertidal environment—parallel to the shoreline—creating a living system of oyster reef. The reef dissipates wave energy and traps sediment, encouraging establishment of native vegetation. This living shoreline is self-maintaining, regrowing quickly when impacted by storm events, and adjusting naturally to gradual sea level change.



The southeastern corner of MacDill AFB in 2008 soon after completion of the near-shore oyster reef.

(Photo by Peter Clark; Tampa Bay Watch)

Using Natural Processes

Creation of nearshore reef stabilizes the shoreline by reducing wave energy, trapping sediment deposits, and allowing salt marsh and mangrove habitat to establish along the barren shoreline. Additionally, the oyster reef increases marine habitat, providing refuge, food, and structure for a host of motile and sessile marine organisms.



Volunteers place Lo-Pro Reef Ball units (or concrete oyster domes) by hand to facilitate the creation of oyster reef in the intertidal environment.

(Photo by Peter Clark; Tampa Bay Watch)

Broadening Benefits

Volunteer reef-building events were conducted, which created opportunities to educate the community on coastal ecosystems and also provided economic benefits through the use of voluntary labor. More than 1,490 volunteers and 4,480 person hours have been contributed to reef building and planting salt marsh. In addition to stabilizing the shoreline, this innovative yet cost-effective living system approach for natural shoreline stabilization improved water quality and enhanced upland and marine habitat diversity. Baitfish, mullet, minnows, conch, blue crabs, sheephead, heron, ibis, egret, and raccoon either utilized the reef as habitat or accessed the reef for food. The project decreased erosion along the eastern shoreline, particularly at the southeast corner. The stabilized shoreline prevented the loss of natural resources and coastal habitat and protected an archaeological site and government assets.



Looking south across the Phase I site in 2003 before oyster reef construction begins.
(Photo by Peter Clark; Tampa Bay Watch)

Promoting Collaboration

This community-based coastal restoration project was a collaborative effort between MacDill AFB and Tampa Bay Watch, a non-profit organization focused on education and the restoration of Tampa Bay. Considered innovative when it began in 2004, the project garnered both financial and hands-on support from multiple partners, including the U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration, Hillsborough County, and the Tampa Bay Estuary Program.



Looking south across a fully stabilized Phase I site in 2015.
(Photo by Jason Kirkpatrick; MacDill AFB Environmental Office)



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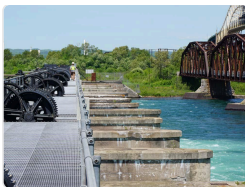
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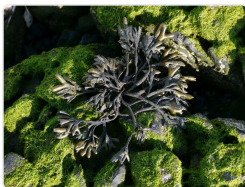
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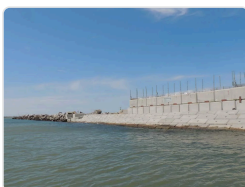
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