Final Report

on

Shipe Woods Habitat Protection and Marsh Restoration Project

TCEQ Contract # 582-7-77831-22

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Prepared for:

Galveston Bay Estuary Program
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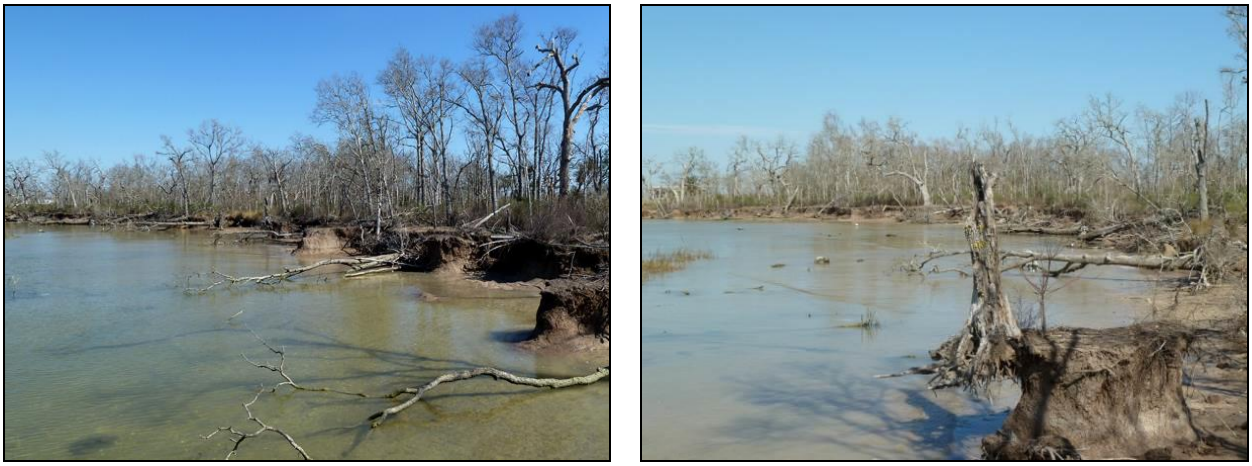
Executive Summary

Shipe Woods is a 14.26-acre Trinity Bay-front property acquired by the Galveston Bay Foundation (GBF) as a conservation property in 1991. Wave energy greatly impacted the shoreline of this property with severe erosion and habitat loss. Within the past 15 years, an estimated 100 feet of Shipe Woods' shoreline eroded, encroaching upon and severely impacting the property's riparian forest. Over the past 40 years, approximately two (2) acres of the property was lost to erosion. Just prior to this project, trees continued to fall off of the three-foot bluff into the bay as the soil eroded from beneath them. GBF and project partners developed the Shipe Woods Habitat Protection and Marsh Restoration project to reduce wave energy impacting the shoreline, halt erosion of the shoreline, and promote deposition of suspended sediments landward of the structure. After acquiring the necessary permits and competitively bidding the project, GBF oversaw the construction of a 725-foot rip-rap breakwater placed a maximum of 225 feet off of the existing bluff shoreline. The placement of the breakwater created a two (2)-acre calm water habitat area between the structure and shoreline that has the potential to restore intertidal wetlands as elevations allow or to potentially be a placement area for future dredge material to raise elevations for wetland creation.

Project Description

The Shipe Woods Habitat Protection and Marsh Restoration project set a goal to protect a 14.26-acre wooded conservation property adjacent to Trinity Bay in Chambers County from continued erosion and to re-establish fringing marsh habitat along its shoreline. Shipe Woods was acquired by the Galveston Bay Foundation (GBF) as a conservation property in 1991. Within the past 15 years, an estimated 100 feet of Shipe Woods' shoreline eroded, severely impacting the riparian forest. Over the past 40 years, approximately two (2) acres of the shoreline was lost to erosion. Just prior to this project, trees continued to fall off of the three-foot bluff into the bay as the soil eroded from beneath them.



Bluffed shoreline conditions at project site

The Shipe Woods Habitat Protection and Marsh Restoration project set out to reduce wave energy impacting the shoreline from Trinity Bay, halt erosion of the shoreline, and promote deposition of suspended sediments landward of the structure. The anticipated outcomes of the project were to:

--construct up to 900 feet of rock breakwater along the eroding shoreline;
--restore an estimated ½-acre of estuarine intertidal salt marsh; and
-- protect a valuable 14.26-acre riparian conservation property.

This project directly implements the Habitat Protection Action Plan within *The Galveston Bay Plan* (GBEP 1993), the bay's comprehensive coastal management plan. The Plan concludes that habitat loss—particularly loss of wetlands—is the most critical issue affecting Galveston Bay and subsequently lists the restoration, creation, and protection of wetlands among its top priority initiatives (HP-1). The project also addresses and provides the intended follow-up to another of high priority action item (HP-5) within *The Plan*—the acquisition and protection of quality wetlands. While the acquisition of the property has been addressed, diligent maintenance of the property is required to ensure future contributions from these areas in support of plant, fish, and wildlife species. Additionally, the project implements conservation priorities and strategies identified in the *Habitat Conservation Blueprint* (HCB) (GBF 1998). Shipe Woods is included in the site inventory of the HCB (p. 80), which identifies the problem of

shoreline erosion at the site. The HCB also identifies the entire Trinity Bay East Shoreline as eroding and recommends conservation strategies including the construction of wavebreaks (p. 82).

Project Methodology

Initially, breakwater design and construction was intended to mimic previously completed projects along the East Bay shoreline of the Anahuac National Wildlife Refuge (ANWR). The project at ANWR was constructed by a very economical land-based construction method. Construction of this project, too, was intended to be land-based, with access along an existing unimproved access road on the south end of the property. The road would require improvements to support access and use by heavy construction equipment. A small area the shoreline would also be prepared and used for staging of rock and equipment. However, after visiting the site with several project partners, it was suggested that the project should be designed in a manner that would allow contractors to bid the breakwater construction either using a land-based construction method or a water-based construction method. The potential advantage of a water-based construction method was that the breakwater could be placed further offshore than with land-based techniques. This would provide for additional acreage of potential wetland restoration behind the breakwater. It was decided that GBF would pursue to receive construction bids on both methods of construction.

In order to move forward, it was determined that a wetland delineation would need to be completed on the unimproved access road prior to submittal of U.S. Corps of Engineers (USACE) permit application. GBF contacted the consulting firm ERM to perform the delineation. A portion of the delineation was completed on a pro-bono basis, and considered an in-kind donation to the project. It was determined that minimal wetlands were present in the path of the unimproved road. It was also determined that the impacts would be minor and could be addressed with a Nationwide Permit (NWP) application to the USACE. GBF again contracted with ERM to determine the exact wetland impact that would be created by improving the road to allow for heavy equipment access. ERM created permitting drawings of the road improvement that would be needed for permitting. However, in this process, it was determined that just 0.03 acre of wetlands would be impacted by the potential road improvements. GBF was made aware that any impacts less than 0.1 acre do not require USACE permitting. GBF presented this information to its own Wetland Permit Review Committee, which did not object to the findings of ERM's report.

In late February 2013, GBF submitted applications for a Nationwide Permit 27 from USACE and a coastal easement from the Chambers-Liberty Counties Navigation District for breakwater construction. GBF received coastal easement number 2013-01 from the Navigation District on April 30, 2013. GBF received official word from USACE on June 6, 2013 that SWG-2013-00186 was issued per NWP guidelines and that the project was permitted as of April 12, 2013.

With permits in hand, GBF advertised the project for bids in the *Anahuac Progress* newspaper on June 12 and 19, 2013. GBF held an on-site job visit for the project on June 21, 2013. The purpose of the job visit was to allow potential bidders access to the project site to inspect site conditions and to ensure they understood the project objectives and what would be expected of the selected contractor. One contractor showed up for the job visit and another contractor visited the site on his own time. Bids were received on June 27, 2013. GBF received two bids for the project, one for construction utilizing land-based construction methods and one utilizing water-based construction techniques. After reviewing the proposals, it was determined that the water-based construction technique would be preferred, and a notice of award was issued to Crawley's Shoreline Construction, Inc. on July 2, 2013. A construction contract between Crawley's and GBF was executed on July 16, 2013, and after receiving all required paperwork from the contractor, a notice to proceed was issued on August 1, 2013.

The contractor began mobilizing construction equipment to a construction yard on Double Bayou, just south of the project site, on August 4 and began project construction late in the day on August 5. The contractor utilized several small outboard boats to push light-loaded barges of concrete rip-rap to the project site. At the project site, a trackhoe on a small barge was utilized to place the rip-rap, constructing the breakwater. The project was considered substantially complete at a walkthrough on August 16, 2013. At the walkthrough, two punchlist items were identified: 1) to slightly raise the elevation of the breakwater by adding additional rip-rap along the structure and 2) to place warning signs bayward of the structure to warn boaters. The punchlist items were completed on September 5, 2013.

Project Results

At the conclusion of this grant agreement, August 31, 2013, all required tasks have been completed.

The project resulted in the construction of an approximately 725-foot breakwater to protect the Shipe Woods Preserve from continued erosion. The breakwater was constructed approximately 225 feet from the existing shoreline at its furthest distance. Two reflective warning signs were placed just bayward of the breakwater to warn boaters in the area. The north end of the breakwater was left open, and two low spots were integrated into the breakwater structure to enable ingress/egress for water and wildlife. The breakwater protects 14.26 acres of upland riparian habitat and created a two (2)-acre calm water habitat area between the breakwater and shoreline. This two (2)-acre area has the potential to restore intertidal wetlands as elevations allow or to potentially be a placement area for future dredge material to raise elevations for wetland creation.

After the completion of this grant agreement, on September 28, 2013, 55 community volunteers participated in GBF's Marsh Mania community-based marsh restoration event and planted 22 18-gallon buckets of smooth cordgrass at the Shipe Woods project site. The Marsh

Mania event planted an area of approximately 0.3 acres. All plants were donated by NRG and have a donation value of $2,750.00 not reported in the budget table below.

Also, after the completion of the grant agreement, GBF was able to make improvements to the access road on the property. This will allow for better access for GBF staff in managing the property in the future (invasive species removal, tree plantings, and marsh plantings). This portion of the project was completed with private funds not reported in budget table below.

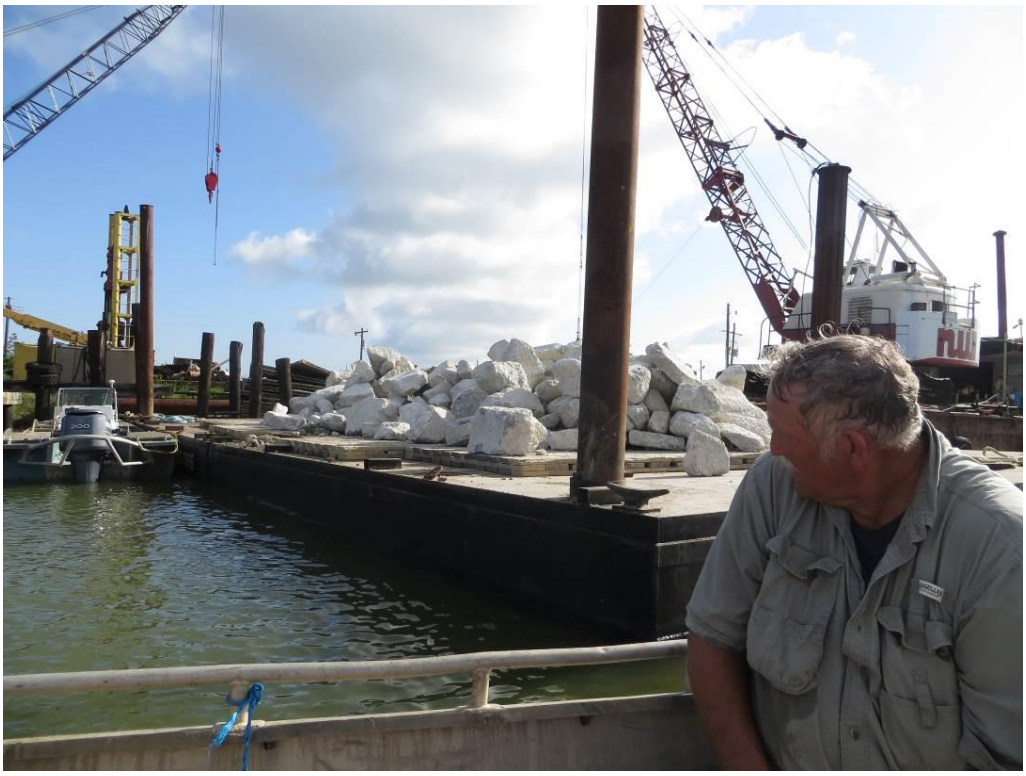
Project Funding

Partner	Contribution	Contribution Type
GBEP (TCEQ)	$25,000.00	State
RAE-NOAA	$32,735.47	Federal
USFWS-CP	$30,000.00	Federal
ERM Foundation	$4,000.00	Private
Cheniere Energy	$9,566.47	Private
Entergy	$4,411.52	Private
ERM	$6,725.00	Private in-kind
Total	**$112,438.46**	

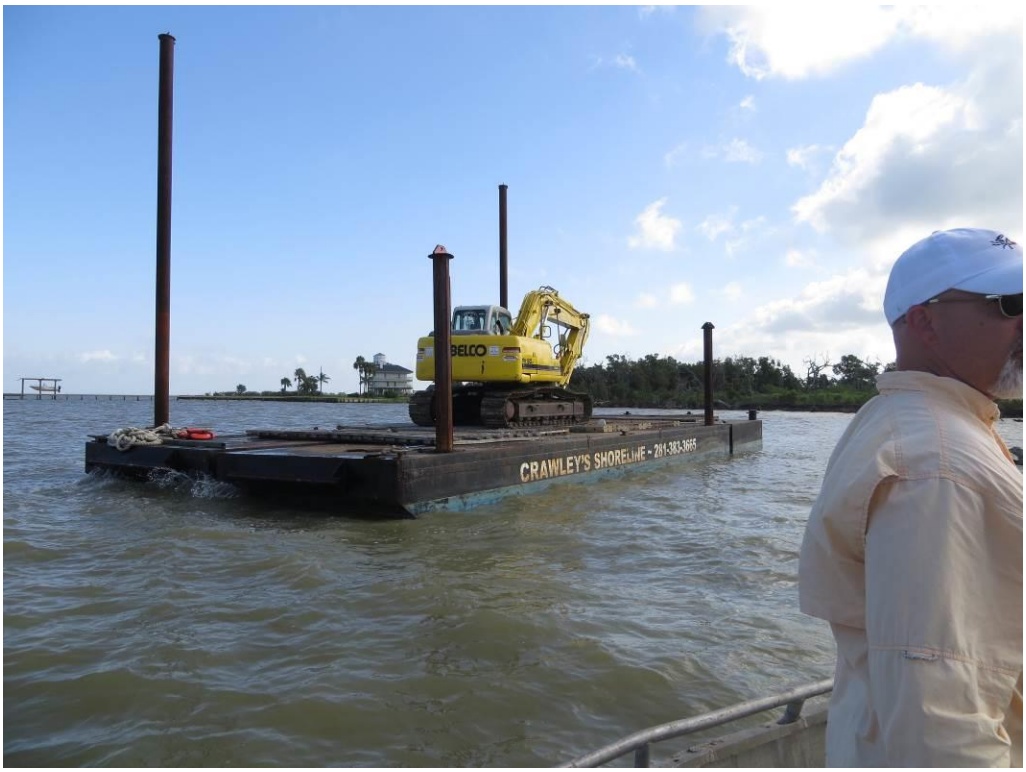
Project Conclusions and Lessons Learned

Going into the project it was assumed, based on similar completed projects in the area, that the Shipe Woods project would be constructed with land-based access and construction techniques. After discussions with project partners, it was determined to bid the project allowing for proposals for both land-based and water-based construction techniques. As it turned out, a bid using the water-based technique was economically competitive, and the project was able to be completed using this method. This allowed for a larger area of open water to be created behind the breakwater and available for wetland restoration. By remaining flexible during project planning and exploring multiple options for construction, GBF and project partners were able to not just meet the goals of this project, but to exceed them.

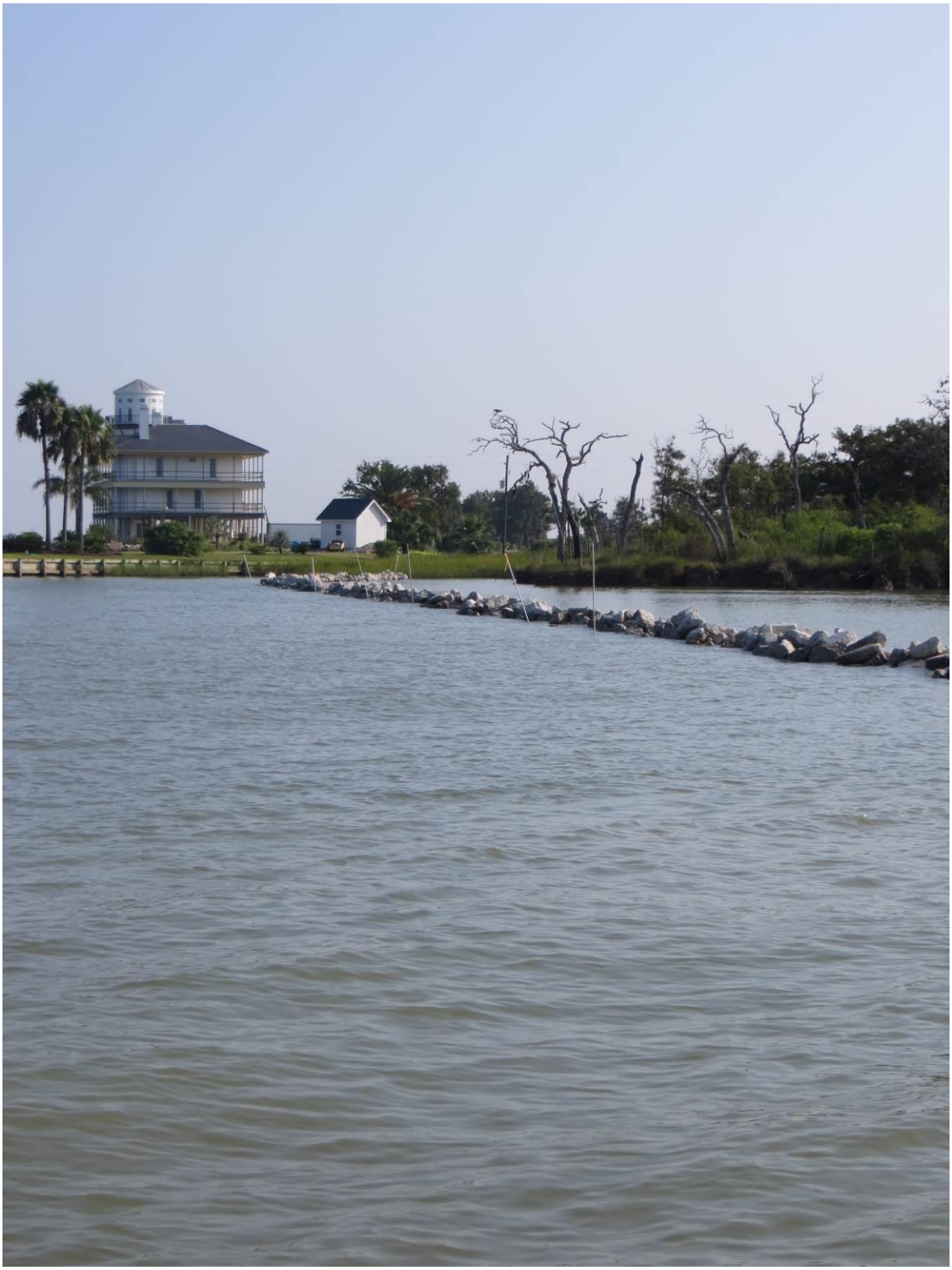
Project Photographs



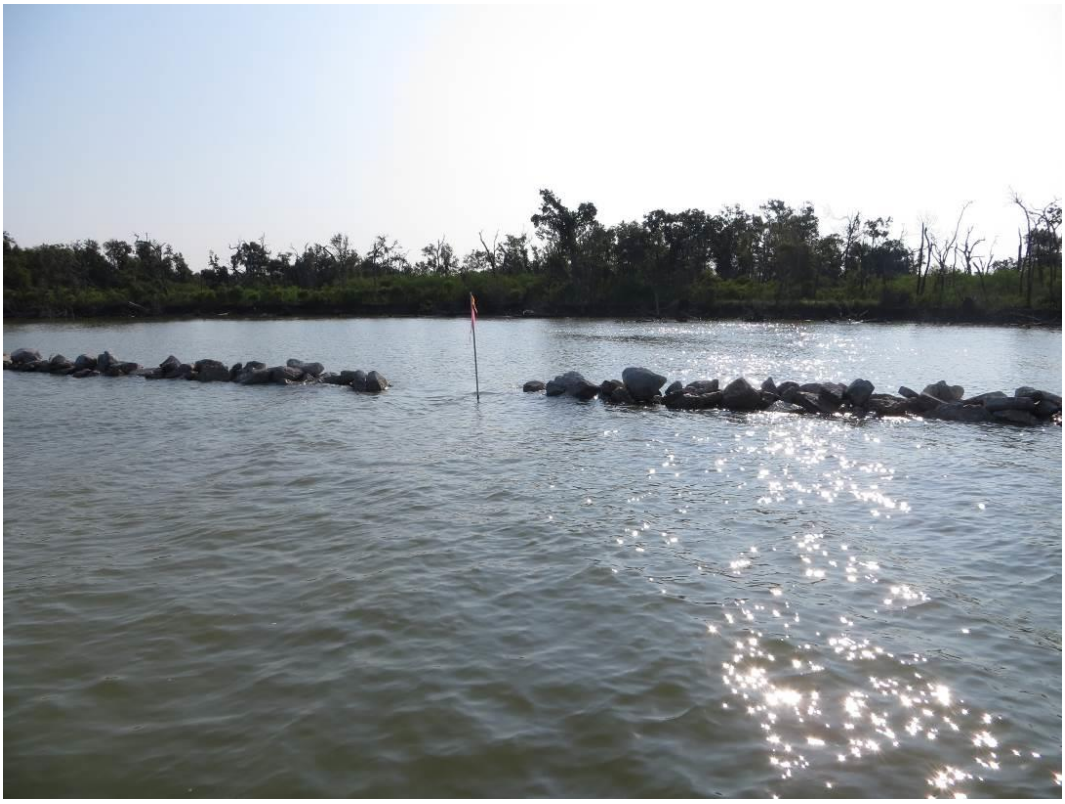
Rip-rap staged on barge and ready to transport to site



Trackhoe on barge used to deploy rip-rap

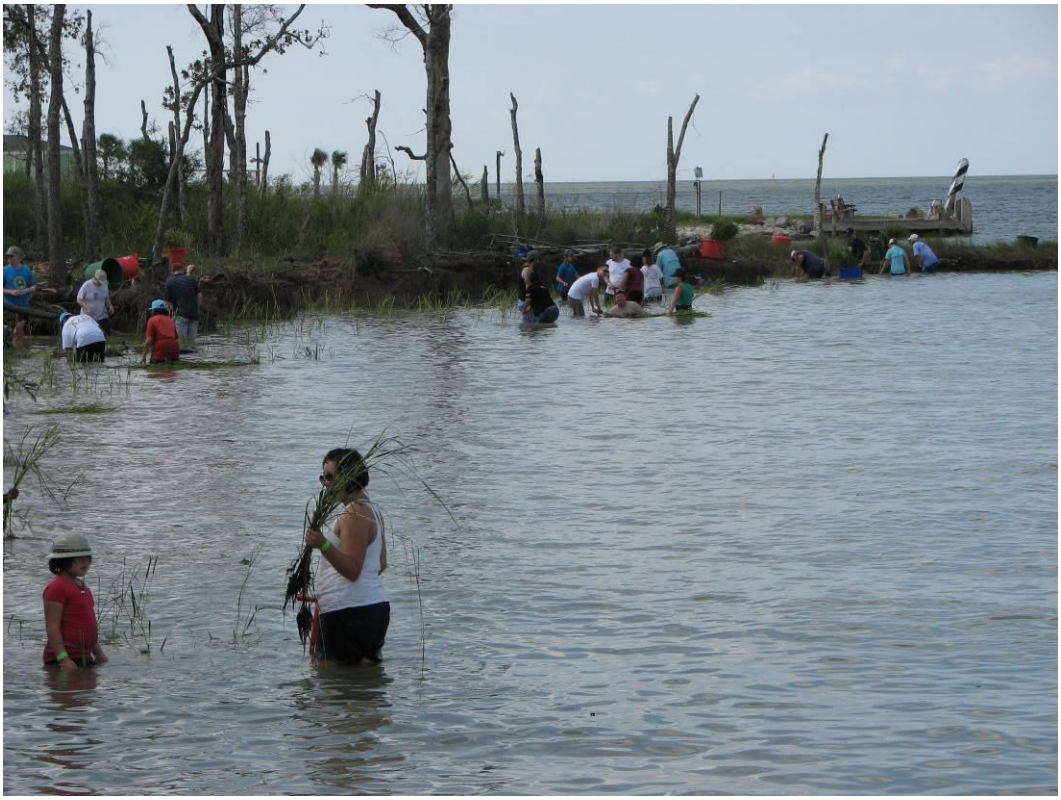


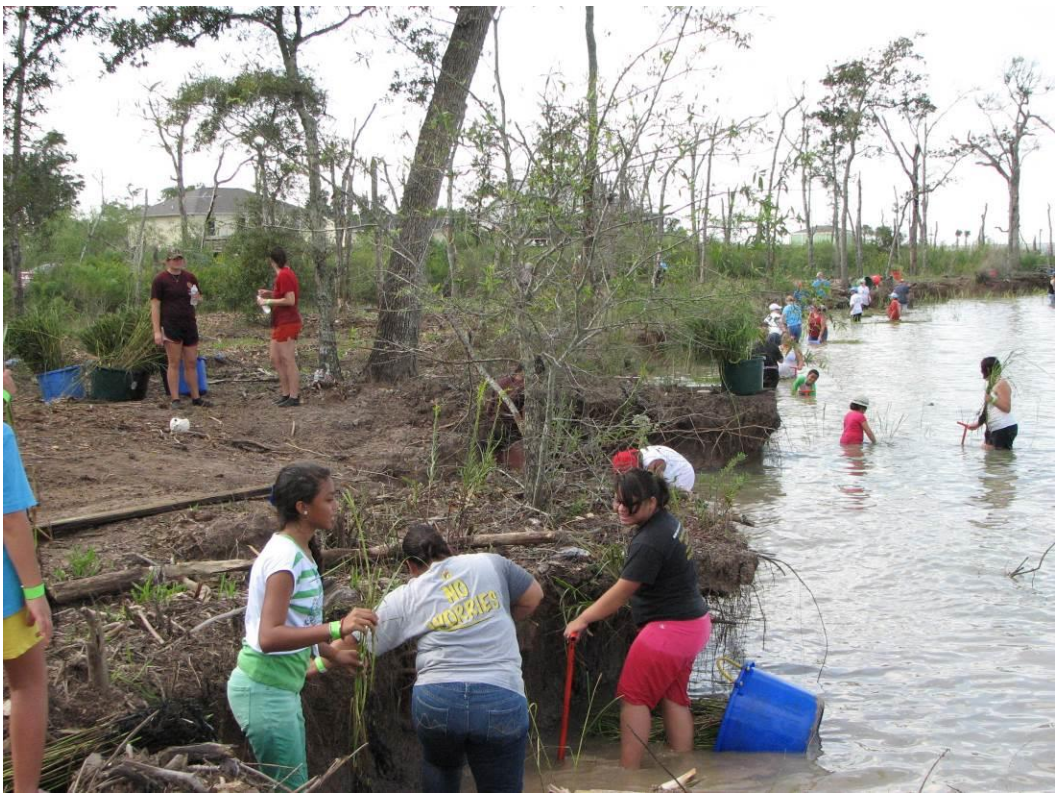
View of breakwater on August 16, 2013



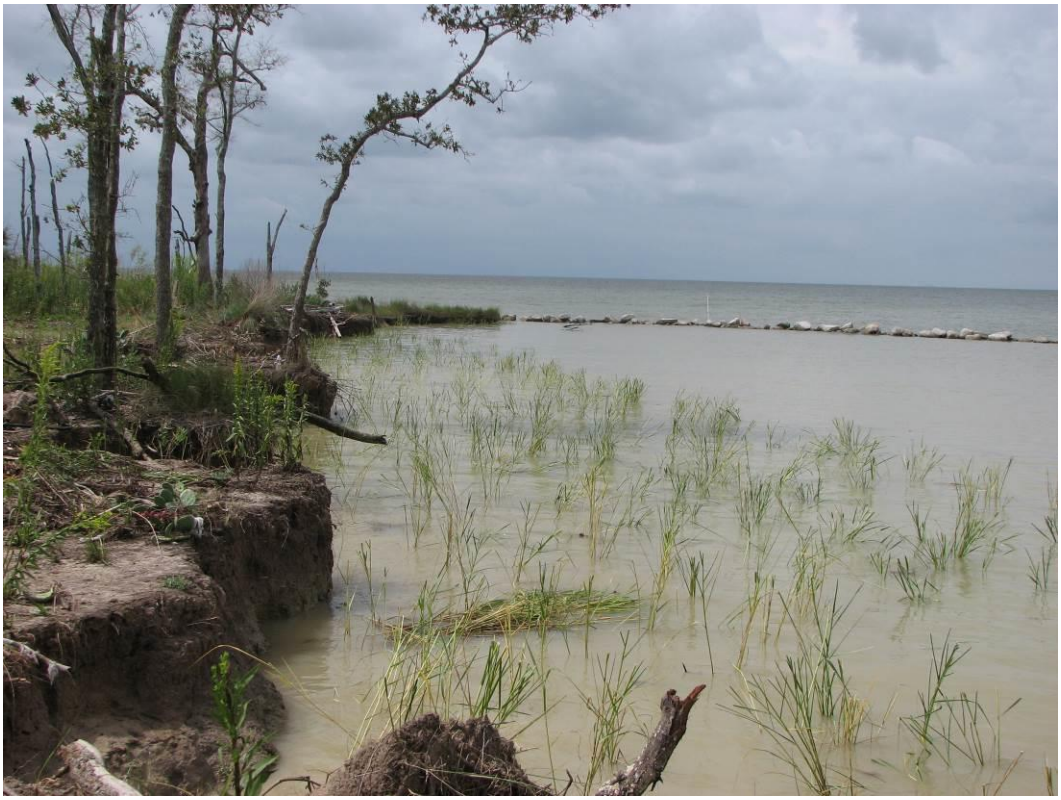
View of “low spot” in breakwater that allows ingress/egress of marine organisms

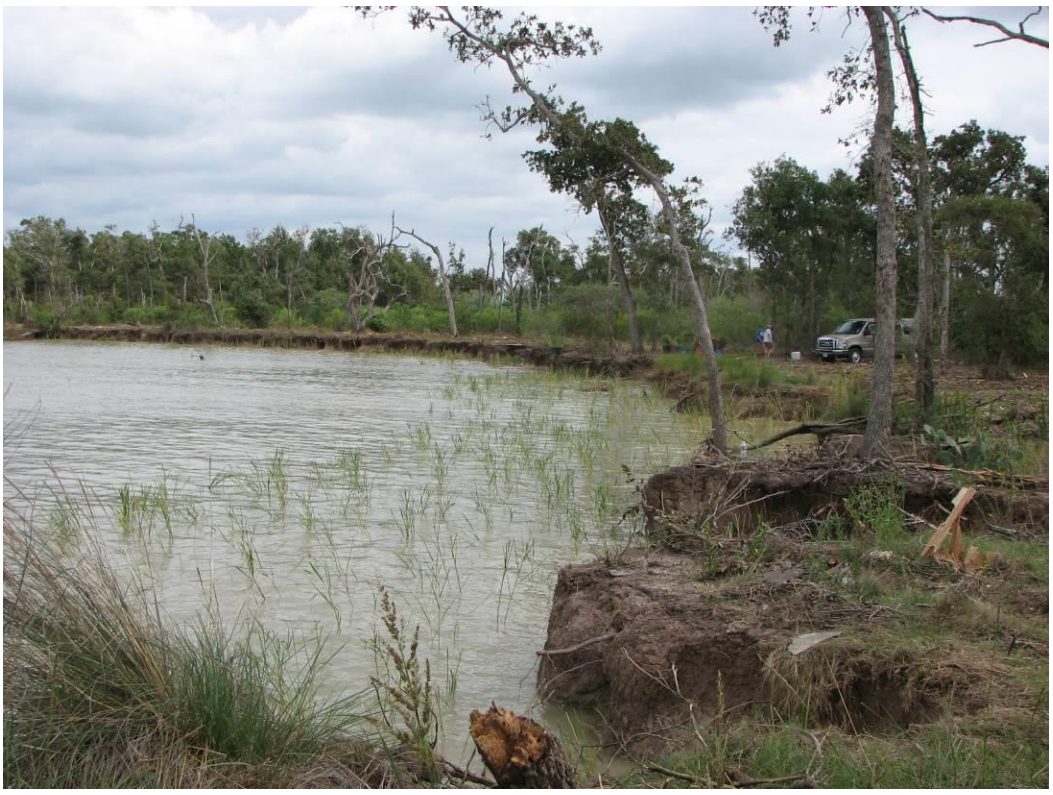
Reflective warning sign marking breakwater location





Marsh Mania volunteers planting on September 28, 2013





Post-Marsh Mania planting