



# Evaluating Living Shorelines In Coastal South Carolina

## THE ISSUE

Living shorelines, like those formed by oyster reefs, support a healthy coastal environment and can protect coastal areas from hazards like storms. They do this by helping to stabilize salt marshes and prevent erosion. Unlike bulkheads or other hard structures, living shorelines have added benefits like creating habitat.

Homeowners see value in this type of nature-based solution, and are looking to living shorelines as a way to protect private property. However, it is still a new erosion control strategy and the science and coastal permitting process need to catch up to demand.

That's why several agencies recently partnered on a project to learn more about living shorelines. The groups plan to study a variety of types of living shorelines in different conditions. This will provide the scientific foundation for living shorelines to be effective as an erosion control device in coastal South Carolina.

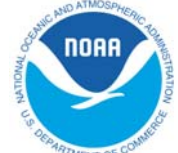
## THE SCIENCE

This research project will help answer questions about living shorelines in the following ways.

1. *Monitoring existing living shoreline sites:* The South Carolina Department of Natural Resources and others have constructed oyster reef-based living shorelines on public land for many years. The time is right to go back to these sites and monitor how the shorelines and the marshes behind them have changed. This can provide insight into how living shorelines will behave over time.
2. *New experimental sites:* These sites will be constructed to test a wider range of salt marsh habitats than previously studied. For example, sites will be built to test areas that are more "pluff-muddy" than usual, or where wave energy is higher.
3. *Case studies:* The project team wants to ensure that the experimental sites are relevant and that they represent conditions typical of marsh-front properties. Therefore, we hope to partner with a handful of marsh-front property owners for test sites.



DNR



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## CASE STUDY SITES

Case study sites are meant to represent typical marsh-front properties that are experiencing erosion. Sites will be constructed over the course of the next two years, and will be monitored on a regular basis until approximately 2020. Case study sites adjacent to private property will provide key information and will help determine the best strategies that homeowners can use to protect their property.

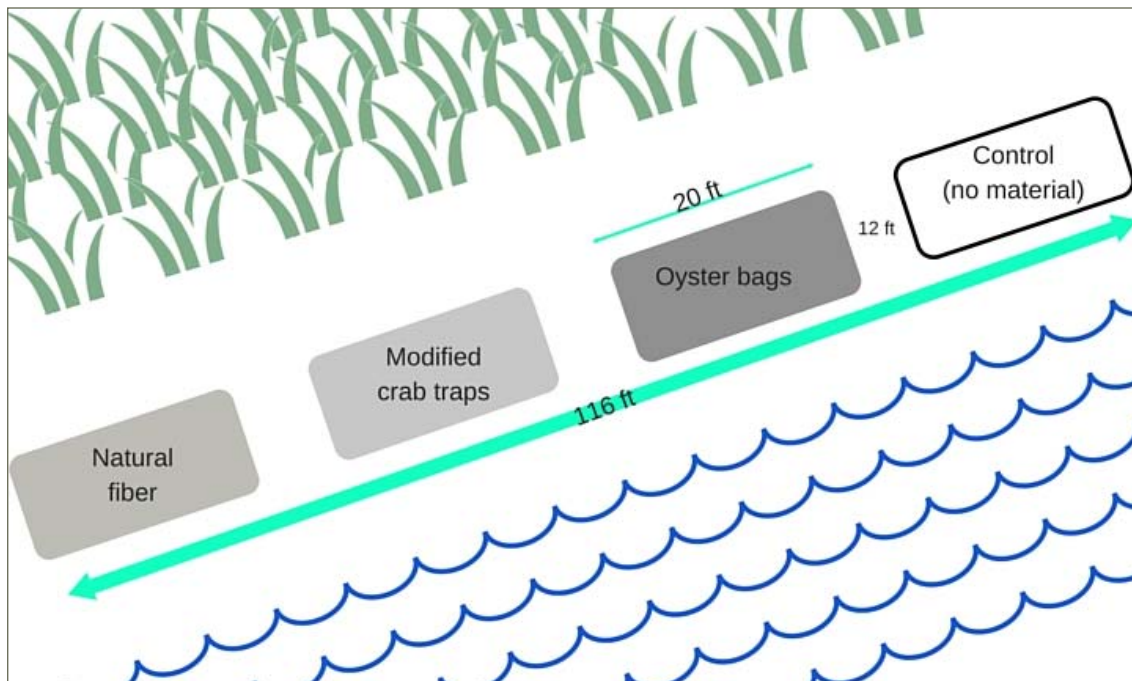
There are potential benefits of having a case study site. If the marsh is experiencing erosion, the living shorelines are designed to slow, or even prevent the erosion, allowing marsh grass to fill in. This can help protect upland property. Additionally, living shorelines contribute to a healthy environment by providing habitat and by filtering the water. There are several things to consider, and we expect that you have lots of questions. Some initial information about the case study sites is below.

### What is the process?

After the potential sites are identified and surveyed, a permit application will be placed with the Army Corps of Engineers. They permit projects like this in the public marsh to make sure they will not interfere with navigation. We will then have discussion with the property owners who are adjacent to the marsh. If everyone makes the choice to move forward with the project, then it will be installed either this Spring or next Spring (2017). The sites will be monitored monthly after installation.

### What does a test site look like?

The diagram below shows an example of the layout used to test different materials at each location. The order of the materials may differ at each site, but the overall size and layout will be similar.







### What do the materials look like?

These photos show the three different materials that will be tested at each location.



*Top left:* Modified crab traps attract oysters and will eventually grow into an oyster reef.

*Top right:* Oyster shell bags are mesh bags filled with oyster shell. They attract oysters and will eventually grow into an oyster reef.

*Bottom left:* Curlex Blocs are natural fiber blocks. They will break down over time.

*Bottom right:* Natural fiber Coir Logs are rolled up logs made of natural fiber. They will break down over time.

All of these materials work by allowing sediment to build up behind them. This allows the marsh grass to fill back in and helps stop erosion.



### **How long will the site stay in place?**

It is our goal that these new living shorelines will become permanent and positive features of the shoreline, creating both habitat and reducing erosion.

### **Will people need to access my property to build the site or monitor it?**

No, everything can be accomplished by boat.

### **How often will monitoring occur and what does that entail?**

Generally speaking sites will be visited at least quarterly to collect information on the establishment of oysters for some treatments, as well as collection of data on more physical characteristics such as the location of and changes to the shoreline and edge of the saltmarsh. Monitoring efforts will be minimal in terms of their disturbance to the living shoreline, and wherever possible data will be collected based on photographs taken at the site, rather than having to actually remove anything. Work will typically occur during the low tide window and can last anywhere from 1 to 4 hours depending on the types of data that need to be collected.

### **What will happen to the living shoreline over the course of the study?**

Over time, we expect that the erosion will slow down or stop. Oysters should be growing on the oyster bags and the crab traps. For the coir logs or other fiber materials, the marsh should fill in behind them and the structures themselves will degrade over time. Pictures below show an example of an oyster bag reef (left) and a crab trap reef (right) several years after they were set out.



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