

Living Shorelines: A Way To Help Combat Hurricane Season?

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LIVING SHORELINES SUPPORT RESILIENT COMMUNITIES

Living shorelines use plants or other natural elements—sometimes in combination with harder shoreline structures—to stabilize estuarine coasts, bays, and tributaries.



One square mile of salt marsh stores the carbon equivalent of **76,000 gal of gas** annually.



Marshes trap sediments from tidal waters, allowing them to **grow in elevation** as sea level rises.



Living shorelines improve **water quality**, provide fisheries **habitat**, increase **biodiversity**, and promote **recreation**.



Marshes and oyster reefs act as natural **barriers** to waves. **15 ft** of marsh can **absorb 50%** of incoming wave energy.



Living shorelines are **more resilient** against storms than bulkheads.



33% of shorelines in the U.S. will be **hardened** by **2100**, decreasing fisheries habitat and biodiversity.



Hard shoreline structures like **bulkheads** prevent natural marsh migration and may create seaward **erosion**.



As we enter the [2020 hurricane season](#), landscapers who work in areas with large coastlines know potential storm damage is about more than just fallen trees and debris. Flooding and erosion can cause some of the costliest and irreparable destruction to a property. Even without a storm event, the progressive erosion of a coastline by wave action over years can be just as damaging. To complicate matters further, coastal [sea levels in the U.S. are rising](#)—and at an accelerating rate, according to a “report card” released this past February by researchers at William & Mary’s Virginia Institute of Marine Science. The U.S.’s most visited national park, the [National Mall Tidal Basin](#) in Washington, DC, is just one example of how rising tidewaters are submerging walkways, eroding soil, and damaging the roots of DC’s famed cherry trees.

Traditionally, bulkheads have been installed to protect a property from water encroachment. Given the cost and materials, many property owners expect bulkheads to protect their shoreline indefinitely. However, even in the best of cases, bulkheads often completely fail after twenty or thirty years. They can begin to lose sediment from behind the bulkhead even sooner and cause erosion on neighboring properties. And ultimately, even a weak hurricane can demolish a brand new bulkhead.

Another thing many may not realize is that once a bulkhead is installed, the intertidal zone (the land between high and low tide) is often eliminated. By losing this zone, an important habitat for fish and other wildlife disappears, water quality decreases, and storms become more destructive to the property. Despite these things, bulkheads are extraordinarily common along privately-owned shorelines. But what is the alternative?

Living Shorelines

A “living shoreline” is a method of shoreline stabilization that is gaining increased recognition and [governmental action](#). Instead of creating a barrier against natural forces, living shorelines use natural materials – marsh plants, oyster shell, and more to prevent erosion. For instance, a healthy stand of marsh grasses can prevent erosion along shorelines with low to moderate waves by holding sediment together with their root systems. These grasses also: support wildlife by providing food and habitat; trap pollutants before they reach our waterways; and buffer storms by absorbing waves, rather than attempting to deflect them. Living shorelines essentially re-naturalize a coast and can often self-maintain with little assistance.

So why are bulkheads so much more popular? While reasons vary from person to person, there are some that stand out. Property owners are more likely to choose a bulkhead if their property already had one or if neighbors have one. Often, bulkheads are chosen simply because the property owner has not heard of living shorelines. Most importantly, when a property owner calls a marine contractor or engineer to help protect their shoreline, most have been installing bulkheads for their entire careers. Such contractors are familiar with bulkheads, are comfortable with the process of installing one, and bulkheads are uniform across pretty much any property. By contrast, one living shoreline design does not fit all situations and requires knowledge more akin to landscape design.

Site Evaluation

While living shorelines may seem complicated, installing one is a relatively straight-forward task, especially in low wave energy areas like bayous, creeks, and small rivers. While every property is different, the same steps necessary to plan a successful landscape design will create a successful living shoreline: site evaluation, plant selection, permitting, and implementation.

The first step in a living shoreline project is to evaluate the site. This includes evaluating the slope, assessing wave energy, and taking note of neighboring properties. If a bulkhead is already installed, then the options are to plant in front of it using specialized containers, remove it, or in the case of a highly degraded bulkheads, plant behind it. What is most important is that the slope of the shoreline is gradual enough to allow plants to migrate unassisted. This could mean grading the shoreline or filling, but in many low-energy sites this isn't even necessary.

Assessing wave energy is critical to site evaluation since it's the primary driver of erosion in many cases. If wave energy is low, then plantings can be

done without wave breaks. But if waves are an issue, choosing a “wave break” is essential. Wave breaks can range from natural fiber logs for lower wave energy sites to rock breakwaters in high wave energy sites. It’s important to note that adding breakwaters to a design adds to the cost and may complicate permitting. However, these should rarely be needed for small, privately owned properties in low-energy settings.

If neighboring properties have bulkheads, this can also impact the success of a living shoreline. Bulkheads can bounce waves towards neighboring properties, affecting where sediment is deposited and eroded. If a neighbor has a bulkhead, it’s not necessarily a deal-breaker. Instead, it means that some sort of sill or other wave break may be needed. Again, all projects are different. Once a site evaluation is complete, it is time to really dig into the planning stages.

Planning



Planting smooth cordgrass as part of a living shoreline project at Camp Wilkes in Biloxi, MS.

The piece that makes a living shoreline “living” is the plants. Choosing the right plant species for a project can be the difference between a shoreline that can grow forever versus one that fails by the end of the year. The best way to choose plants for a living shoreline is to identify native plants that are already growing along the waterway. Often, there is a dominant wetland plant species in the region that will likely be the best bet. For instance, in the northern Gulf of Mexico, we most often use either black needlerush (*Juncus roemerianus*) or smooth cordgrass (*Spartina alterniflora*) in our living shoreline designs.

You can also ask your local nursery or Extension agent for help. While dominant plant species are best suited for these kinds of projects because they are adapted to waves, lots of sunlight, and possible salinity, other

plants can be incorporated into living shorelines to meet client needs. For instance, if a client wishes to have something pretty and flowering and is located on a waterway that is mostly fresh, you could add some bulltongue arrowhead (*Sagittaria lancifolia*) or another flowering plant to the design. A big advantage of a living shoreline is that plants can serve the practical purpose of preventing erosion, but also more aesthetic purposes too.

Permitting

Once a site is selected and a design is created for a living shoreline, the not so fun part begins... permitting. "Permitting" can be a scary word, but the secret is to talk to your permitting agencies early and often in the process. Agencies requiring permits can differ depending on region. Common permitting agencies include the US Army Corps of Engineers (USACE), state resource agencies, and local municipalities. The cost and requirements associated with living shoreline permitting also differ by region, but many agencies are actively working to streamline the process. There are also environmental consultants in nearly every state that specialize in living shoreline permits and design.

Installation

With a permit in hand, installing a living shoreline is the next and final step. In the simplest of cases, which many are, installing a living shoreline involves digging a hole and putting a plant in it. It's not much more complicated than that. Of course, if you need to use wave breaks, then it can be a bit harder. Natural fiber logs can be staked into the ground or oyster shell can be laid out in bags or loose to create a sill. These options are relatively low effort compared to more heavy duty wave breaks like rock breakwaters which require equipment to place effectively.

Unfortunately, once plants are in the ground and waves are dealt with, the shoreline is probably not looking fantastic. Often, transplant stress will leave your plants looking a bit ragged for a while. However, if they were planted correctly, they should perk up and start filling in open areas by the end of the first or second growing season. In the years following installation, the living shoreline will grow denser and start providing natural benefits again.

Business Opportunity

Living shorelines are good for the environment; are not too difficult to design, permit, and install; and are increasingly being requested by property owners. In fact, living shorelines are often cheaper to create than installing or repairing a bulkhead, making them even more appealing to property owners. All this means living shorelines could be a great business opportunity for landscapers. And since living shorelines are still a new concept to many, competition among contractors is currently low.

Martin is an extension associate with Mississippi State University. She is also the wetland specialist for the Northern Gulf of Mexico Sentinel Site Cooperative and the Mississippi-Alabama Sea Grant Consortium.

Sparks is director of coastal and marine extension and an assistant extension professor and at Mississippi State University. He's also an assistant director for outreach and coastal ecology specialist with the [Mississippi-Alabama Sea Grant Consortium](#), which has a variety of resources for [contractors](#) interested in designing and building living shorelines. He can be contacted at eric.sparks@msstate.edu.

For More Information

Many states along the US East and Gulf coasts also have living shoreline contractor trainings, some with certifications. Reach out to your local Extension office or natural resource agency to learn about any upcoming courses in your area. Or visit these helpful sites:

[Gulf Living Shorelines Resources Catalogs \(TX, LA, MS, AL, FL\)](#)

[LivingShorelinesAcademy](#)

[FloridaLivingShorelines](#)

[Maryland Living Shorelines](#)

[NJ Living Shorelines](#)