



## The Link Between Land and Water

### Living shorelines are good for everybody

by Lynn Teo Simarski and Guy G. Guthridge

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Exploring the Chesapeake for over a year aboard our trawler Bright Pleiades, we have watched the natural shoreline being armored at an alarming rate.

Homeowners in nearly every creek and cove are ringing the shore with rock: hardening large stretches to death and creating new rocky habitat for the Bay's ecosystem. Many have no idea that a living shoreline can protect property and habitat.

Along many Chesapeake shores, water grades subtly into upland through a living membrane of sandy curves and green marshes, the nurseries of fish and crabs. Natural forces nibble at these lowlands, as sea level rises and land sinks.

Maryland's coast erodes, on average, six to nine inches a year.

Shore owners strike back by piling rock, called riprap, and installing bulkheads and other defenses.

"Most people think erosion is a bad thing," says Kevin Smith, a Maryland Department of Natural Resources biologist who focuses on habitat restoration. "The fact is, erosion is a necessary part of the Bay ecosystem."

Maryland has 7,525 miles of tidal shore; of 4,118 miles surveyed in a Virginia Institute of Marine Science study, 2,083 miles were hardened.

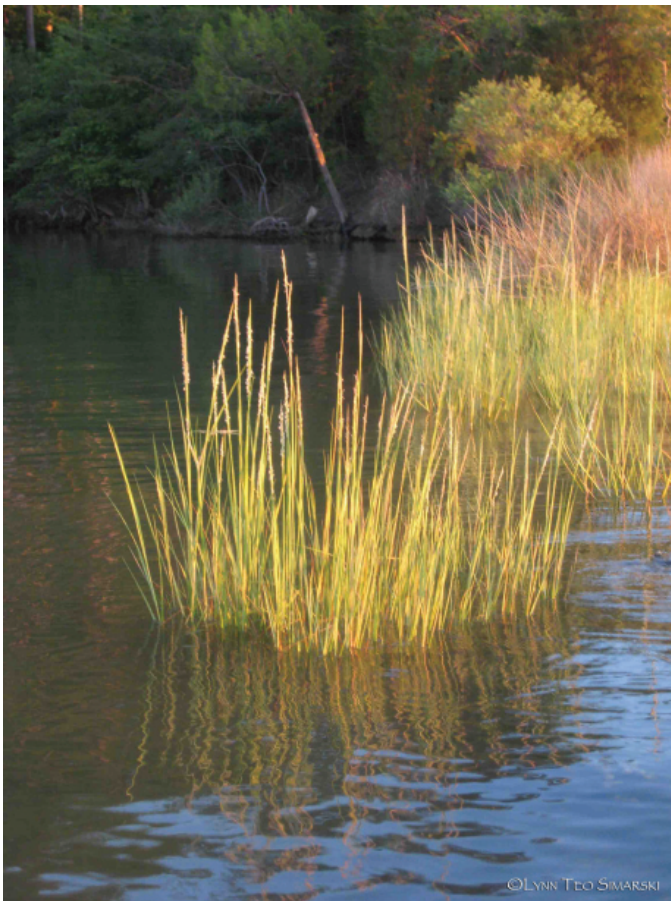
Bulkheads and riprap sever sea from shore, while a living shoreline preserves the link and can guard property as well or better. A nascent living shoreline installed at Chesapeake Bay Environmental Center near Kent Island made it through Hurricane Isabel, even though it was not fully established, Smith says. Some Virginia living shorelines, among more than 30 studied by the Institute, also continued to protect uplands during the hurricane.

Back in the 1970s, when overall wetlands policy took shape, it did not take sea-level rise into account. Later, "we began to understand that intertidal resources need to be mobile over geologic time," says the Institute's Carl Hershner. In other words, sand and sediment migrate, and marshes need uplands to colonize as water rises.

Still, property owners expect to be able to do what they want with their land, Hershner says. Too often, contractors and landowners choose hardening. Today, an individual is capable of altering shoreline on a scale formerly attained only by the Army Corps of Engineers.

The public, not the landowner, tends to bear the hidden costs of hardening, according to a recent National Academy of Sciences report on mitigating shore erosion. A hardened shore can starve nearby areas of the sediment that replenishes them. This can set off a domino effect as one homeowner after another hardens a stretch of shore. Habitat is whittled away, but no one tracks what happens to the creatures that lived there.

Jana Davis, marine ecologist at the Chesapeake Bay Trust, has been documenting the reverse: How a living shoreline brings life back. To test whether a restored shoreline really delivers biodiversity, Davis' group counted critters at two swaths



Living shoreline

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Chesapeake  
Winter

of former bulkhead: one at St. John's College in Annapolis and the other at West River United Methodist Center.

The quickest comebacks to the rejuvenated beaches were grass shrimp and mummichog, a small fish; both are vital to the base of the food chain. Sheepshead minnows, juvenile spot and young crabs also increased.

Nature offers clues to designing a living shoreline. For instance, a natural marsh edge may be protected by a low sill, with openings called tidal gates that let creatures move in and out. Mimicking these gates may increase life in a living shoreline.

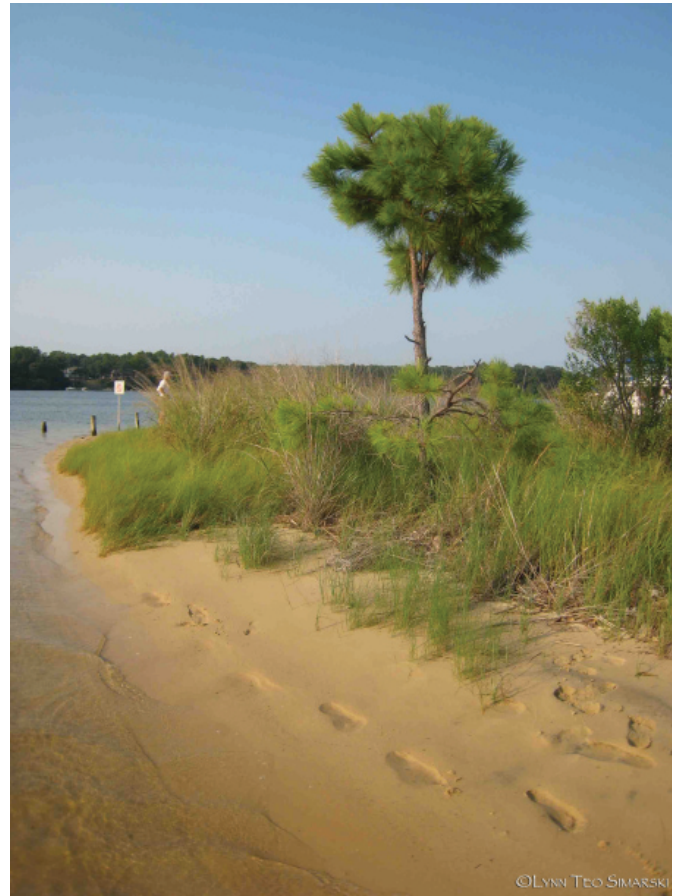
### Putting the Life Back

During our recent visit to a restored shore along Shady Side's Discovery Village, a couple of horseshoe crabs had gotten stuck in the rock placed to protect new plantings. Kevin Smith put the crabs gently back in the water.

The shore at Parrish Creek, formerly bulkheaded, has been smoothed to a gradual slope and allowed to sit. "The tides grade it and you get the slope that nature wants," says Smith.

Coconut-fiber logs protect new native marsh plants: phragmites (the indigenous species), smooth cordgrass and salt-marsh hay. Native marsh hibiscus, a pink-white flower of August marshes, returned on its own. Switchgrass, swaying in the breeze, is, says Smith a "super-fibrous grass that knits a shoreline together." In the water, pipefish, a seahorse relative, swim among the seagrass. On shore, planted native trees like pin oak, redbud and black gum are reclaiming the lawn.

A narrow gap in the vegetation lets kayakers reach the beach. "A living shoreline," Smith says, "is good for people too."



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