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New Report Questions Hard-Edged 'Living Shorelines' in Estuaries

Mar. 5, 2012 — The increasing use of large breakwaters and other hard structures to reduce erosion in "living shorelines" along East and Gulf Coast estuaries may be no better for the environment than the ecologically harmful bulkheads they were designed to replace, according to a report this week by scientists at Duke and Western Carolina universities.

Originally, living shorelines were designed to use natural methods such as replanted indigenous marsh grass and re-introduced oyster reefs to stabilize and protect eroding shorelines.

Many environmental groups and government agencies have advocated their use in recent years as an eco-friendly alternative to wooden bulkheads and other forms of shoreline armoring in low wave-energy environments such as estuaries and sounds.

The new report, however, reveals that since 2000, the use of large-scale hardened structures such as rock walls or offshore breakwaters has increased dramatically at a growing number of sites classified and funded as living shorelines. The researchers surveyed sites from Maryland to Texas -- including in Chesapeake Bay, North Carolina's Pamlico Sound and the South Carolina Low Country -- and found dozens of miles of living shorelines armored with hard stabilization, constructed at the cost of tens of millions of dollars.

"The intent is often to deflect waves and provide extra protection until new grasses or oyster reefs can take hold. But once installed, the barriers are rarely removed," said Orrin Pilkey, James B. Duke Professor Emeritus of Geology at Duke's Nicholas School of the Environment.

"Many projects now contain massive rock structures, with little habitat gain," he said. "These kinds of living shorelines are probably no more ecologically responsible than bulkheads."

"We're concerned the use of massive hard-engineered structures in some of these so-called living shorelines will cause long-term environmental degradation, provide a false sense of accomplishment and shift the focus away from trying to maintain the most natural estuarine shoreline feasible," said Robert S. Young, professor of geology and director of the Program for the Study of Developed Shorelines at Western Carolina.

The sites surveyed by the team exhibited widely varying designs, degrees of hard stabilization, amounts of habitat creation and monitoring. Some are used to protect private property; others are intended to reduce erosion at the margins of vulnerable wetlands.

"The term 'living shoreline' is being used to describe everything from well-constructed vegetative stabilization projects to massive rock revetments where a small planting of marsh grasses seems to be an afterthought," Young said. "These projects are often sold as environmental restoration. But true restoration, such as dam removal on rivers, returns an ecosystem to its original trajectory. Large-scale hard stabilization thwarts this possibility, regardless of what's planted behind the structures."

The report recommends that agencies and groups that fund and advocate living shorelines need to develop a much clearer definition for what an ecologically sound living shoreline should look like. How much rock is too much? How much habitat gain should be expected?

Failure to set such guidelines makes it easier for "bad actors to take advantage of this green-sounding term by building estuarine seawalls with just a hint of green," Young said. "The concept of living shorelines was laudable in the beginning, but the switch to reliance on massive hard stabilization is killing a good idea."

"We recognize the threats erosion poses to our nation's estuaries, especially as sea level rise continues or possibly accelerates in coming years," Pilkey said. "But hard stabilization of any kind does more harm than good. Lessons learned from the use of seawalls, revetments and groins on ocean shorelines -- a practice banned since 1985 in North Carolina and prohibited or restricted in many other states -- shouldn't be ignored in estuaries and sounds."

Report.

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