

COMPARING LIVING SHORELINES AND BULKHEADS

Protecting Your Home and the Chesapeake Bay watershed

WHAT IS A LIVING SHORELINE?

If you are concerned about protecting your waterfront and are interested in enhancing the natural beauty of your property, a living shoreline may be right for you. Living shorelines utilize natural materials like native plants, stone, and sand as a barrier to defend against shoreline erosion and flood impacts.

HOW A LIVING SHORELINE WORKS

Living shorelines are modeled after wetland systems that occur in nature. Wetlands and living shorelines stabilize shorelines by trapping sediment and reducing wave energy with thick vegetation growth. Native plants are especially effective at diffusing and absorbing wave energy as their roots stay in place during storms, allowing vegetation to continue to grow and stabilize the shoreline. The advantages of a living shoreline are twofold: they preserve natural ecosystems and help protect waterfront communities against erosion and storm impacts.

BENEFITS OF WETLANDS AND LIVING SHORELINES

Tidal wetlands are the shallow or saturated areas between land and water; they offer a multitude of benefits such as filtering runoff, which over time, improves water quality. Wetlands can capture and store harmful carbon dioxide from the atmosphere. Wetlands also serve as a vital habitat for wildlife by creating an environment suitable for fish, crabs, oysters, waterfowl and more. In addition, native plants are adapted for local conditions, thus requiring less maintenance over time. Along with shoreline protection, many homeowners can enjoy activities like fishing and kayaking by restoring natural resources along their waterfront.

THE EFFECTS OF A HARDENED SHORELINE

Hardened shoreline structures such as bulkheads, seawalls and revetments are installed to protect property. However, they often have long-term consequences and costly maintenance needs. Instead of absorbing wave energy, they reflect it, resulting in a scouring or scrubbing action of the beach and ocean or river bottom. Beach scouring leads to deeper water, which contributes to vegetation loss and an inhospitable environment for wetland creatures that rely on shallow water habitat. A scientific study found that when seawalls and bulkheads are built there is a 23% loss in biodiversity and around a 45% loss in abundance of marine organisms compared to a natural shoreline¹.

Bulkheads have a ripple effect; once installed, they can negatively affect neighboring shorelines. Waves overtop these structures during flood events, leading to erosion behind the structure and degradation of the structural integrity.

THE EFFECTS OF A HARDENED SHORELINE *continued*

As a result, hardened shorelines can increase the likelihood of property damage while also taking away habitat for shallow-water creatures. Impacts are often more pronounced after major storm events. After Hurricane Isabel in 2003, many property owners with riprap and bulkheads requested assistance from the State of Maryland to repair their shorelines while those who had worked with the state to install living shorelines did not². A living shoreline's efficacy increases over time as plant roots and shoots continue to grow and strengthen, even within dynamic environments, whereas a hardened shoreline can only degrade over time.

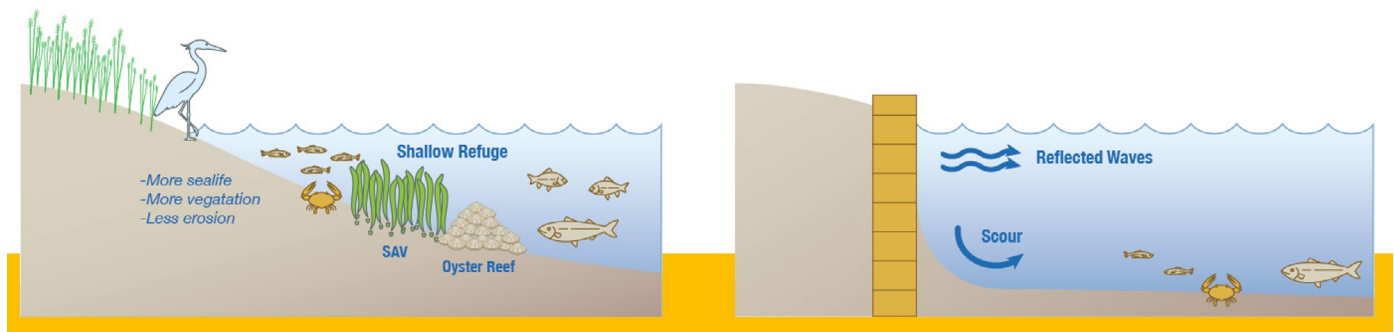
HARDENED VERSUS NATURAL APPROACHES

In the Chesapeake Bay region, bulkheads and seawalls have traditionally been used to protect upland areas. However, in the past few decades marine scientists have learned that these hardened structures can have adverse effects on the larger wetland system. The concept of a living shoreline was first established in the Chesapeake Bay and is therefore well-suited for our watershed. Living shorelines were developed as a cost-effective solution for homeowners to address erosion concerns while mitigating environmental damage. Research on material costs found that, on average, living shorelines are approximately 82% less expensive per linear foot compared to bulkheads³. In the long run, contracting and construction costs of a living shoreline are typically offset because they require far less maintenance and repairs compared to hardened shorelines. Hybrid living shorelines, which include a combination of strategically placed hard structures and natural features, are an alternative method for homeowners who live in areas with high wave action.

WHAT YOU CAN DO

Homeowners can ensure the protection of their shoreline by consulting with local government agencies and local watershed protection groups. These groups can offer expert advice on how to maintain natural shorelines or restore eroding shorelines. Overall, waterfront communities are increasingly vulnerable to sea level rise, storms, and erosion. Living shorelines are resilient in the face of our everchanging environment. Homeowners can protect their waterfront and the natural resources that make the Chesapeake Bay a great place to call home.

LIVING SHORELINE VS BULKHEAD



1 Gittman, R. K., Scyphers, S. B., Smith, C. S., Neylan, I. P., & Grabowski, J. H. (2016). Ecological consequences of shoreline hardening: A meta-analysis. *BioScience*, 66(9), 763–773. <https://doi.org/10.1093/biosci/biw091>

2 Maryland Geological Survey. (2003). Chesapeake Bay Shore Erosion. Hurricane Isabel and Shore Erosion in Chesapeake Bay, Maryland. Retrieved October 12, 2021, from http://www.mgs.md.gov/coastal_geology/isabel/isabel4.html.

3 Living shorelines. Naturally Resilient Communities. (n.d.). Retrieved October 12, 2021, from <http://nrcsolutions.org/living-shorelines/>.