

LIVING SHORELINES FOR COASTAL RESILIENCE

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WHY IT MATTERS

Living shorelines are a **nature-based solution** for shoreline protection and are the required stabilization method for tidal shorelines in Virginia, where suitable. Living shorelines use plants, sand, and sometimes rock or oyster structures to protect coastlines by mimicking natural shorelines. Unlike hardened structures like riprap revetment (rocks along the shoreline) or bulkheads (wooden or metal sea walls), living shorelines create habitats, such as tidal marshes and oyster reefs, that enhance coastal resiliency. They also decrease storm impacts when compared to hardened structures, reduce erosion, filter pollutants, support biodiversity, and absorb wave energy, buffering communities from storm surges and flooding.^{1,2,3}

Erosion along fringe marshes is a key threat to wetlands throughout the coastal rivers of Virginia.⁴ Marshes can become more resistant to erosion because of beneficial species interactions. Young ribbed mussels land on low marsh wetland grasses and nestle themselves into the root systems, filter nitrogen pollution from the water column, replenish the sediment, and stimulate wetland growth. This decreases the likelihood of excessive nitrogen in the surrounding water, reducing opportunities for harmful algal blooms to thrive and creating healthier ecosystems. The relationship between ribbed mussels and low marsh grasses further increases coastal resiliency by enhancing marsh stabilization.⁵ The byssal threads—known as “the beard”—that mussels use to anchor themselves into wetland grasses and oyster structures installed at living shorelines create a strong webbing that reduces erosion.

CURRENT LANDSCAPE

Living shorelines, also referred to as shoreline stabilization projects when implemented through the **Virginia Agricultural Cost-Share (VACS) SE-2 Program**, are among the most technically complex and expensive conservation practices to install. Agricultural living shoreline projects can cost millions of dollars in planning, designing, permitting, and construction. As demand for these projects rises, maintaining dedicated funding and streamlining administrative procedures is vital to ensure farmers can access funding for high-priority shoreline stabilization projects.

Non-agricultural programs are insufficient to meet statewide demand for resilient tidal shorelines. The **Virginia Conservation Assistance Program (VCAP)** is helpful but not available to all Virginia residents as landowners are only eligible for funding if they live in

a city or county with a participating **Soil and Water Conservation District (SWCD)** or within a locality that holds a partnership agreement with a SWCD to offer the program. VCAP funding is also unavailable for most high-wave energy sites, limiting the types of and locations of projects that can be funded.

The **Shoreline Erosion Advisory Service (SEAS)** offers free technical assistance to private landowners and localities in Virginia with erosion problems. While SEAS was previously focused on tidal areas, their services are now available in non-tidal areas statewide. SEAS staff are critical to helping landowners make informed shoreline management decisions and understand state law. While the program has expanded, SEAS staffing numbers remain unchanged even as responsibilities (including technical assistance, site investigations, written reports, plan reviews, and construction inspections) have increased.

OPPORTUNITIES

A comprehensive approach to shoreline resilience in Virginia requires adequate support for high-cost agricultural shoreline stabilization projects, expanded assistance for non-agricultural landowners, and sufficient technical capacity to support project development and implementation. A statewide Living Shoreline grant program can expand assistance to landowners who are not currently eligible for VCAP, and support implementation in vulnerable coastal communities that lack the resources to finance nature-based shoreline stabilization solutions through other means. This program could address existing funding gaps and focus on the implementation of large-scale living shoreline projects.

Further, at least two additional **Virginia Department of Conservation and Recreation (DCR)-SEAS Full Time Employees (FTEs)** would provide dedicated capacity to the newly expanded program for technical assistance, project review, and landowner support, helping to facilitate the continued use of living shorelines throughout the Commonwealth.

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TOP TAKEAWAYS

Living shorelines are a nature-based solution that improves water quality and coastal resilience through buffering storms and reducing erosion, and are the default stabilization method for tidal shorelines in Virginia.

A statewide Living Shoreline grant program would expand access to these practices by addressing gaps in eligibility and funding across current programs

Virginia's ability to address shoreline erosion depends on adequate funding for agricultural and non-agricultural implementation programs, and sufficient technical capacity.

ENDNOTES

1. Barry, S. C., Hernandez, E. M., & Clark, M. W. (2024). Performance Assessment of Three Living Shorelines in Cedar Key, Florida, USA. *Estuaries and Coasts*, 48(1), 7.
2. Smith, C. S., Gittman, R. K., Neylan, I. P., Scyphers, S. B., Morton, J. P., Joel Fodrie, F., Grabowski, J. H., & Peterson, C. H. (2017). Hurricane damage along natural and hardened estuarine shorelines: Using homeowner experiences to promote nature-based coastal protection. *Marine Policy*, 81, 350–358. <https://doi.org/10.1016/j.marpol.2017.04.013>
3. Bilkovic, D. M., Isdell, R.E., Guthrie, A. G., Mitchell, M.M., and Chambers, R.M. (2021). Ribbed mussel *Geukensia demissa* population response to living shoreline design and ecosystem development. *Ecosphere* 12(3). <https://doi.org/10.1002/ecs2.3402>
4. Bilkovic, D. M., Mitchell, M.M., Isdell, R.E., Schliep, M., and Smyth, A. R. (2017). Mutualism between ribbed mussels and cordgrass enhances salt marsh nitrogen removal. *Ecosphere* 8(4) <https://doi.org/10.1002/ecs2.1795>
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Shoreline restoration project in Norfolk, VA

Photo by Sue Mangan

