

## Living Shoreline Definitions

1/04/2019

**NC Division of Coastal Management.** Living shorelines include a suite of options for shoreline erosion control that maintain existing connections between upland, intertidal, estuarine, and aquatic areas which are necessary for maintaining water quality, ecosystem services, and habitat values. Unlike vertical stabilization measures such as bulkheads, living shoreline techniques typically use native materials such as marsh plants, oyster shells, and occasionally minimal amounts of structural materials (e.g. stone) to stabilize estuarine shorelines, minimize erosion, and enhance habitats.

<https://files.nc.gov/ncdeq/Coastal%20Management/documents/Estuarine%20Shorelines/FINAL%20Living%20Shorelines%20Strategy%20Feb%205%202014.pdf>

**Florida Living Shorelines.** A living shoreline uses natural materials to stabilize the shoreline and maintain valuable fish and wildlife habitat. Living shoreline projects utilize a variety of materials such as wetland plants, oyster shell, coir fiber logs, sand, wood, and native rock. <http://floridalivingshorelines.com/what-is-a-livingshoreline/>

**Florida Sea Grant.** A living shoreline is “a shoreline management practice that provides erosion control benefits; protects, restores, or enhances natural shoreline habitat; and maintains coastal processes through the strategic placement of plants, stone, sand fill, and other structural organic materials (e.g. biologs, oyster reefs, etc),” according to NOAA.

<https://www.flseagrant.org/florida-living-shorelines/>

**Florida DEP.** Living shorelines utilize natural habitat elements for erosion control through careful site evaluation and strategic placement of habitat components along the upland-water interface (Ray-Culp 2007). Living shorelines serve to reduce erosion through the implementation of a natural salt marsh composed of deeply-rooted, fast-growing plants that provide shallow water habitat for marine species, attenuate and reduce wave energy, increase sediment acquisition, improve water quality, reduce pollution via wetland filtration, and moderate the effects of storms and floods. <https://floridadep.gov/fco/fco/content/living-shorelines>

**Georgia DNR.** Novel engineering approaches providing alternatives to conventional armored shorelines that are constructed to protect uplands lying adjacent to estuarine waters from erosion. Living Shorelines use bioengineering in combination with native vegetation plantings to stabilize or enhance wetland habitats. The primary goal of a Living Shoreline is to avoid engineering designs that hinder or disrupt the natural connections between aquatic environments and adjacent uplands. Secondary goals include the preservation of tidal exchange, sediment conservation, natural plant communities and necessary shoreline dynamics associated with sea level rise. <https://coastalgadnr.org/LivingShorelines>

**University of Georgia Marine Extension/Georgia Sea Grant.** Living shorelines mimic nature to stabilize marsh banks by using native plants and oyster shells. Tides are constantly changing, and a living shoreline works with the natural environment to stabilize the shoreline and allows the marsh and upland to remain connected. <https://gacoast.uga.edu/research/major-projects/living-shoreline/>

**South Carolina Department of Health and Environmental Control.** Living shoreline projects use a variety of structural and organic materials, such as wetlands plants, oyster reefs, coir fiber logs, compatible fill and stone.

<https://scdhec.gov/environment/your-water-coast/ocean-coastal-management/living-shorelines-working-group>

**VIMs Center of Coastal Resource Management.** A shoreline management practice that addresses erosion by providing for long-term protection, restoration or enhancement of vegetated shoreline habitats. This is accomplished through the strategic placement of plants, stone, sand fill and other structural and organic materials. Living Shoreline Treatments do not include structures that sever natural processes & connections between riparian, intertidal and aquatic areas such as tidal exchange, sediment movement, plant community transitions & groundwater flow.

<https://scholarworks.wm.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1217&context=reports>

**Maryland Department of Natural Resources.** Living shorelines are the result of applying erosion control measures that include a suite of techniques which can be used to minimize coastal erosion and maintain coastal process. Techniques may include the use of fiber coir logs, sills, groins, breakwaters or other natural components used in combination with sand, other natural materials and/or marsh plantings. These techniques are used to protect, restore, enhance or create natural shoreline habitat.

<http://dnr.maryland.gov/ccs/Pages/livingshorelines.aspx>

**Delaware Department of Natural Resources and Environmental Control.** A “living shoreline” is a method of shoreline stabilization and protection for wetlands that is built using natural materials and native plants. This process mimics natural shoreline habitats by incorporating a combination of wetland plants, biodegradable coconut-fiber coir logs, fiber matting, oyster shell bags, and live mussels and/or oysters. They are a habitat friendly alternative to rip rap, bulkhead or stone revetments. Living shorelines create wetland habitat that is important for blue crabs, oysters, fish, birds and plants. They can also stop erosion, increase water quality, armor the shoreline from erosion and defend our coasts from damaging storm wave energy.

<http://www.dnrec.delaware.gov/Admin/DelawareWetlands/Pages/LivingShoreline.aspx>

**Pennsylvania ??????**

**New Jersey Department of Environmental Protection. CZM Rules.** A shoreline management practice that addresses the loss of vegetated shoreline, beaches, and habitat in the littoral zone by providing for the protection, restoration or enhancement of these habitats. This is accomplished through the strategic placement of plants, stone, sand, or other structural and organic material. There are three types of living shorelines: natural, hybrid, and structural. Natural living shorelines include natural vegetation, submerged aquatic vegetation, fill, and biodegradable organic materials. Hybrid living shorelines incorporate natural vegetation, submerged aquatic vegetation, fill, biodegradable organic materials, and low profile rock structures such as segmented sill, stone containment and living breakwaters seeded with native shellfish. Structural living shorelines include, but are not limited to revetments, break-waters, and groins.

**New York State Department of Environmental Conservation.** Shoreline techniques that incorporate natural living features alone or in combination with structural components such as rock, wood, fiber rolls, bagged shell, and concrete shellfish substrate.<sup>1</sup> This combination is also called hybrid. To be considered a living shoreline the techniques shall:

- Control or reduce shoreline erosion while maintaining benefits comparable to the natural shoreline such as, but not limited to, allowing for natural sediment movement;
- Use the minimum amount of structural components necessary for hybrid techniques to obtain project goals;
- Improve, restore, or maintain the connection between the upland and water habitats; and
- Incorporate habitat enhancement and natural elements, frequently includes native re-vegetation or establishment of new vegetation that is consistent with a natural shoreline typical of the site location.

[http://www.dec.ny.gov/docs/fish\\_marine\\_pdf/dmrlivingshoreguide.pdf](http://www.dec.ny.gov/docs/fish_marine_pdf/dmrlivingshoreguide.pdf)

**Connecticut Department of Energy and Environmental Protection.** Living shorelines techniques utilizing a variety of structural and organic materials, such as tidal wetland plants, submerged aquatic vegetation, coir fiber logs, sand fill and stone to provide shoreline protection and maintain or restore coastal resources and habitat.

[https://www.ct.gov/deep/cwp/view.asp?a=2705&Q=512226&deepNAV\\_GID=1622](https://www.ct.gov/deep/cwp/view.asp?a=2705&Q=512226&deepNAV_GID=1622)

**Rhode Island ?????**

**Massachusetts ?????**

**New Hampshire Department of Environmental Services.** The use of native vegetation, oyster reefs, sand fill and limited stone to provide shoreline stabilization and protection. Living shorelines aim to mimic the natural landscape, maintain a shoreline's ability to carry out natural processes, and provide habitat for species. Also known as a "soft" shoreline approach, green infrastructure, nature-based technique, and many other terms

**Maine Department of Agriculture, Conservation and Forestry.** Living shoreline is a broad term that encompasses a range of shoreline stabilization techniques along estuarine coasts, bays, sheltered coastlines, and tributaries. A living shoreline:

- has a footprint that is made up mostly of native material;
- incorporates vegetation or other living, natural "soft" elements alone or in combination with some type of harder shoreline structure (e.g. oyster reefs or rock sills) for added stability; and
- maintains continuity of the natural land–water interface and reduce erosion while providing habitat value and enhancing coastal resilience.

**NOAA Ocean Services.** A protected and stabilized shoreline that is made of natural materials such as plants, sand, or rock. Living shorelines use plants or other natural elements to stabilize estuarine coasts, bays, or tributaries. <https://oceanservice.noaa.gov/facts/living-shoreline.html>

**Wikipedia.** Living shorelines are a relatively new approach for addressing shoreline erosion and protecting marsh areas. living shorelines incorporate as many natural elements as possible which create more effective buffers in absorbing wave energy and protecting against shoreline erosion. The process of creating a living shoreline is referred to as soft engineering, which utilizes techniques that incorporate ecological principles in shoreline stabilization. The natural materials used in the construction of living shorelines create and maintain valuable habitats.

Structural and organic materials commonly used in the construction of living shorelines include sand, wetland plants, sand fill, oyster reefs, submerged aquatic vegetation, stones and coir fiber logs. [https://en.wikipedia.org/wiki/Living\\_shorelines](https://en.wikipedia.org/wiki/Living_shorelines)

**Oyster Restoration Workgroup.** Natural bank stabilization approaches often called “living shorelines.” The approach can employ plants, sand, oyster shell (often in bags), organic materials (e.g., biologs made of jutte), concrete (castles) material-filled structures (OysterBLKs™) or other recycled or natural structural materials (e.g., fossil shell, granite, concrete) to provide shoreline protection and if properly constructed enhance upland (landward) eroding invaluable habitats such as marshes and mangroves. It typically works best in lower energy habitats than those that have higher wave energies. <http://www.oyster-restoration.org/>

**Restore America’s Estuaries.** Living shorelines is a term used to define a number of shoreline protection options that allow for natural coastal processes to remain through the strategic placement of plants, stone, sand fill, and other structural and organic materials. <https://www.estuaries.org/living-shorelines>

**H.R.4525-115<sup>th</sup> Congress (2017-2018) and S.3087-115<sup>th</sup> Congress (2017-2018).** Living shoreline project (A) means a project to mitigate the effects of erosion caused by shoreline flooding or inundation, currents, and wave energy, through project design that stabilizes a shoreline by using natural materials to create buffers to absorb the impact of coastal storms, flooding, and wave energy and to prevent or minimize (or both) shoreline erosion, that—

- (i) incorporates as many natural elements as possible, such as native wetlands, submerged aquatic plants, native grasses, shrubs, or trees;
- (ii) utilizes techniques that incorporate ecological and coastal engineering principles in shoreline stabilization; and
- (iii) to the extent possible, maintains or restores existing natural slopes and connections between uplands and adjacent wetlands or surface waters; and

(B) may include, but not be limited to, the use of—

- (i) natural elements, such as sand, wetland plants, logs, oysters or other shellfish, submerged aquatic vegetation, native grasses, shrubs, trees, or coir fiber logs; and
- (ii) structural materials, such as stone, concrete, wood, vinyl, oyster domes, or other approved engineered structures.

<https://www.congress.gov/bill/115th-congress/house-bill/4525/text>

<https://www.congress.gov/bill/115th-congress/senate-bill/3087/text?q=%7B%22search%22%3A%5B%22hr+6%22%5D%7D>