

Living Shorelines

Overview

- If the freshwater or saltwater shoreline is experiencing erosion, living shorelines can help stabilize the bank.
- Living shorelines are “green” or nature-based structures that are built on the shoreline using natural materials. They can provide protection from erosion, storm surge, and sea level rise in addition to providing habitat for native species.
- Traditionally, shorelines have been protected using hardened or “grey” infrastructure like bulkheads or riprap. However, these grey infrastructures can increase the rate of shoreline erosion. Additionally, hardened infrastructure can prevent native wildlife from accessing their native habitats. Living shorelines are an environmentally-friendly and more effective alternative to traditional hardened shoreline infrastructures.
- Benefits of living shorelines:
 - Shoreline stabilization
 - Water filtration and pollutant removal
 - Wildlife habitat improvement
 - Shoreline aesthetics improvement
- Living shorelines use natural materials such as oyster shells and biodegradable coconut-fiber logs (coir logs) as well as native plants.
- Living shorelines are effective and sustainable because they mimic natural systems and are therefore able to adapt to changing conditions around them.
- Always plant native plant species.
- Always check to see if the shoreline is in a rare, threatened or endangered shorebird habitat before planting. Protected shorebird habitat presence may limit what/how much you can do.



Key Takeaways

During coastal storms, high-energy waves can destroy shorelines by eroding the bank or by destroying pre-existing hardened or “grey” infrastructures. Shoreline erosion can lead to increased flooding of structures.

Living shorelines offer shoreline protection from storm surge and sea level rise and can reduce costs associated with flood and storm damage.

Estimated Costs/Benefits

*U.S. dollars (2022), estimates are subject to change

Potential Costs		Potential Benefits (1,000 sq ft structure)		
Item	Estimate	Post-Flooding Recovery Action	Estimate	
Materials	\$40-\$50 per linear foot	Flood damaged structure recovery (professional clean-up, mold removal, replacement/ repair of flood damaged items)	1 inch water	\$10,800-\$53,500+
Installation by contractor/design engineer (includes design and construction, not permitting)	\$1,000-\$5,000 per linear foot		4 feet water	\$43,400-\$203,300+
ESTIMATED TOTAL COST (50 ft shoreline)	\$52,000-\$252,500+	ESTIMATED TOTAL SAVINGS	\$10,800-\$203,300+	

I-ADAPT

Shoreline Adaptation

Living Shorelines

Photo credit: DNREC

Potential Funding Sources

- [DNREC Living Shoreline Cost Share Program](#)
- [Delaware Water Pollution Control Revolving Fund](#)
- [Building Resilient Infrastructure and Communities \(BRIC\)](#)
- [USFWS Coastal Program](#)
- [USFWS Delaware Watershed Conservation Fund](#)

Additional Actions

- Remove pre-existing hardened shoreline infrastructure.
- Encourage neighbors to continue your project to extend the limit of the living shoreline onto their properties.

Expected Maintenance

- Check on the living shoreline regularly for changes such as movement, drainage issues, wildlife disturbance, sinking, or dying vegetation in order to detect potential issues early.
- Continue to work with your design engineer after construction is complete to monitor the living shoreline.
- Re-plant native plants and remove trash/debris as needed.

Additional Resources

- [A Tour of Living Shorelines](#)
- [Delaware Living Shorelines Committee](#)
- [Developing Monitoring Plans for Living Shoreline Proj. in DE](#)
- [Site Evaluation for Living Shorelines Projects in Delaware](#)

Resources can also be found at <https://de.gov/iadapt>

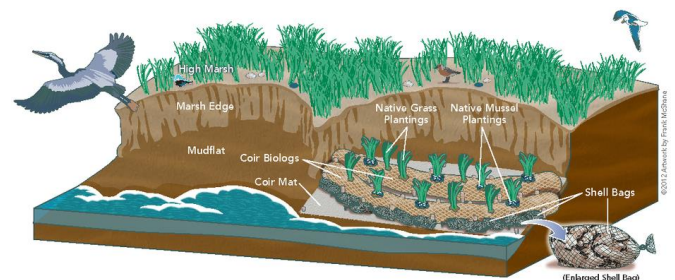
Permitting Agencies

Contacts for permitting requirements include but are not limited to the following:

- Your city and/or county government for local flood ordinances or regulations
- Your city and/or county government for building permits
- [DNREC Coastal Construction Permit](#)
- [DNREC Wetlands and Subaqueous Lands Permit](#)
- [US Army Corps of Engineers](#)

Who to Contact

- Living shorelines contractor and/or design engineer
- [DNREC Living Shoreline Cost Share Program](#)
- [811 Call Before You Dig](#)
- Native plant nursery



Technical definitions and more information are located on the I-ADAPT website: <https://de.gov/iadapt>.



This information is intended to be used for planning purposes. It is not intended to substitute or take precedence over the guidance of design engineers, contractors, utility companies or regulatory agencies.

For more information, contact DNREC's Division of Climate, Coastal and Energy at DNREC_IADAPT@Delaware.gov

