



An Update to Living Shorelines: Impacts of Erosion Control Strategies on Coastal Habitats

In 2010, the Atlantic States Marine Fisheries Commission published *Living Shorelines: Impacts of Erosion Control Strategies on Coastal Habitats* (Thomas-Blate 2010). This factsheet highlights the growing body of literature and lessons learned since the original publication. This is not an exhaustive list, but rather features selected case studies, websites, and references in support of the application of best practices moving forward.

Living shorelines (LSLs) are adopted with increasing frequency to address coastal shoreline erosion issues along both public and private shoreline properties. This type of shoreline protection is mostly used along shorelines fronting bays, sounds, and in other estuarine settings, as beach and inlet systems experience energy levels that are higher than those for which natural materials can successfully be employed.

The National Oceanic and Atmospheric Administration defines LSLs as: “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.” These ‘green’ erosion control installations are often compared to ‘gray’ infrastructure like seawalls and revetments. Unlike their gray alternatives, LSLs integrate habitats across the shoreline landscape by promoting the land-water continuum, provide enhanced habitat for fish and wildlife, naturally adapt to changing sea levels in the face of climate change, and enhance the natural beauty of their adjacent properties.

As sea level rise continues, armoring shorelines against wave energy and erosion will continue to be important to those living along coastal waters. Using LSLs to accomplish this will ensure connections remain established between the uplands and estuaries to maintain or even improve the health of the important fish habitats they sustain.

In 2017, the U.S. Army Corps of Engineers established a Nationwide Permit for Living Shorelines to streamline permitting processes for living shorelines structures. The permit can be accessed here: <https://www.nao.usace.army.mil/Portals/31/docs/regulatory/nationwidepermits/Nationwide%20Permit%2054.pdf>



South Carolina DNR deploys (A) oyster castles, (B) concrete-coated crab traps, and (C) bagged shell as living shorelines. Photo credit: SC DNR.



1 year after living shoreline installation. Photo credit: SC DNR.

For more information

Practical applications training for resource managers and practitioners of living shorelines projects nationally
<https://www.livingshorelinesacademy.org>

Systems Approach to Geomorphic Engineering (SAGE)
<http://www.sagecoast.org/>

Why Living Shorelines are Better than Bulkheads
<https://www.coastalreview.org/2016/02/12896/>

Restore America's Estuaries Living Shorelines Initiatives
<https://www.estuaries.org/living-shorelines>

Naturally Resilient Communities: Living Shorelines
<http://nrcsolutions.org/living-shorelines/>

NOAA's Guidance for the Successful Use of Living Shorelines
<https://coastalscience.noaa.gov/project/guidance-living-shorelines/>

InTeGrate's Advantages and Disadvantages of Soft Shoreline Stabilization
<https://www.e-education.psu.edu/earth107/node/1073>

Virginia Institute of Marine Science's Living Shorelines Decision Tools
http://www.vims.edu/ccrm/outreach/living_shorelines/index.php

Case Study on Designing Living Shorelines for New England Coasts (via NOAA Office for Coastal Management)
<https://coast.noaa.gov/digitalcoast/training/orleans.html>

Hudson River National Estuarine Research Reserve's Sustainable Shorelines Guidance
<https://www.hrner.org/hudson-river-sustainable-shorelines>

New Jersey's Living Shorelines Information
<https://www.state.nj.us/dep/opi/living-shorelines.html>

Delaware Living Shorelines Committee Information
<https://www.delawarelivingshorelines.org/>

Delaware's Living Shorelines Information
<http://www.dnrec.delaware.gov/Admin/DelawareWetlands/Pages/LivingShoreline.aspx>

Partnership for the Delaware Estuary's Living Shorelines Information
<http://www.delawareestuary.org/science-and-research/living-shorelines/>

North Carolina's Shoreline Stabilization Options
<https://deq.nc.gov/about/divisions/coastal-management/coastal-management-estuarine-shorelines/stabilization/stabilization-options>

Georgia's Living Shorelines Information
<https://coastalgadnr.org/LivingShorelines>

Information regarding applications of living shorelines for private property owners of estuarine shorelines in Florida
floridalivingshorelines.com



Punta Rassa, Florida after living shoreline installation (above). A living shoreline constructed in Panama City, Florida using plants and oyster shell (left).
Photo credit: www.floridalivingshorelines.com.

Lessons Learned

Each state has different Coastal Zone Management (CZM) regulations. Contact your state CZM program as well as the appropriate Army Corps of Engineers District to discuss your proposed project.

Some states (e.g. North Carolina) are drafting regional general permits for living shorelines. These regional permits align more specifically with their state general permit, improving the efficacy of the interagency process overall. Contact your state agency to learn more.

Every site should be evaluated on a case-by-case basis. Local ecological parameters should be considered so that each project thrives under the local conditions (see [NOAA guidance on physical site conditions](#)).

An interdisciplinary approach to understanding coastal ecology and site design is important. Projects are most successful when ecologists and geotechnical engineers work together.

Use local knowledge and anecdotes to augment scientific information. People who have watched the shoreline for years understand local conditions and challenges.

LSLs take time to establish. Monitor the site, assess functionality, and adaptively manage ([Delaware Estuary Living Shoreline Initiative](#)).

The number of acres restored is not always the best measure of success. Quality, persistence, and resilience matter. Consider functionality over time.

Viewshed and contractor, homeowner, and local government education is important for LSL buy-in and promotion.

For Case Studies and Further Reading, visit <http://www.asmfcc.org/habitat/hot-topics#LivingShorelines>