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NORTH CAROLINA  
Environmental Quality

## MEMORANDUM

CRC-22-03

TO: N.C. Coastal Resources Commission  
FROM: Whitney Jenkins, Coastal Reserve Training Coordinator  
DATE: January 24, 2022  
SUBJECT: DCM Estuarine Shoreline Strategy Update

DCM's internal Estuarine Shoreline Workgroup has finalized an update to its estuarine shoreline strategy for 2022 through 2026. Through implementation of this strategy, the Division will continue to better understand and manage estuarine shorelines through an integrated approach of planning, permitting, education, and research. This includes promoting the use of living shorelines for shoreline stabilization, understanding shoreline change through mapping, and exploring implementation of resilience strategies including thin-layer deposition and protection of marsh migration pathways. The strategy update takes into account the significant progress already made in estuarine shoreline permitting, research, and outreach.

Between 2009 and 2021, 45 marsh sills, a type of living shoreline, were permitted by DCM. As of 2018, twelve of the 20 CAMA counties have at least one marsh sill and approximately 67 percent of marsh sills are in Carteret (30), Dare (10), and Hyde (9) counties. The average length of a marsh sill is 280 feet with approximately 60 percent of marsh sills less than or equal to 200 feet in length. The length of all marsh sills combined equals 22,424 feet or 4.25 miles. Approximately 86 percent of marsh sills are made of either granite rock, oyster shell, or oyster shell bags. We have yet to quantify the impact of the changes to the marsh sill general permit that took effect in April 2019, but improving living shoreline permit tracking is an objective in the updated strategy.

Over the past five years, research efforts led by the Coastal Reserve's Research Coordinator include:

- Multi-decadal assessment of the impact of bulkheads on salt marsh loss,
- Evaluation of resilience of marsh sill living shorelines to storm events,
- Monitoring performance and structural integrity of marsh sills with regulatory staff,
- Evaluation of thin-layer sediment placement as a tool for enhancing marsh resilience,
- Comparison of ecosystem service provision, including shoreline stabilization, of invasive *Phragmites* relative to native marsh grasses,
- Development of a marsh sill geodatabase, and
- Evaluation of alternative marsh sill material types for promoting oyster restoration and stabilizing shorelines.



The Coastal Reserve’s Training Program has worked with partners including North Carolina Coastal Federation and North Carolina Sea Grant to offer living shoreline training for coastal decision-makers, including real estate agents, marine contractors, engineers, environmental consultants, and agency staff. Since 2016, 13 living shoreline workshops have been offered for these audiences, reaching 492 professionals. Between 2017 and 2021, seven workshops for real estate agents were offered reaching 330 participants. These workshops offer real estate agents four elective continuing education credits. Since the pandemic, workshops have successfully been held virtually, as illustrated by this testimonial from a workshop participant:

*I just finished [Promoting Living Shorelines for Erosion Control] and it was absolutely excellent! It was by far the best and most informative continuing education class I’ve taken since I’ve been in real estate. I learned a great deal today from actual experts in the field that know their subject thoroughly. It was worth every minute of the four hours! I would highly recommend to our Real Estate Commission that this is not only a standard and regularly provided elective course but also mandatory training for all real estate license holders in coastal counties (such as our ethic course).*

To help improve living shoreline training for marine construction professionals, Florida’s marine contractor training was adapted for North Carolina. The pilot training was held in the spring of 2021, with virtual classroom sessions and an in-person field session reaching 32 professionals.

Additional outreach related to estuarine shorelines includes the Coastal Reserve’s Research Coordinator’s presentation on the value and merits of living shorelines at a Nature as Infrastructure Briefing to the Congressional Estuary Caucus; social media posts about estuarine shoreline research, living shorelines, and estuarine ecosystems with original content and amplified partners’ messaging; and enhancement of DCM’s estuarine shoreline [web pages](#).

To continue to better understand and manage estuarine shorelines, the updated estuarine shoreline strategy focuses on:

- Training & outreach – Continue to host real estate and marine construction professional trainings, keep regulatory field staff aware of latest research and monitoring findings related to living shorelines to help them promote to property owners, and living shoreline communication efforts such as development of key messages for outreach products and signage at living shoreline sites.
- Research & monitoring – Continue monitoring living shoreline sites for structural integrity, lateral and vertical erosion, and protection of marsh vegetation; continue to refine research questions for distribution to partners and funding opportunities; and use existing methodology to complete the third iteration of estuarine shoreline mapping and coordinate with other state agencies and organizations to determine additional mapping opportunities.
- Regulatory – Promote living shorelines and cost-share opportunities and incentives related to their construction; finalize a system for tracking living shoreline permits; and compare/explore policy approaches with VA and SC regulatory programs.
- Coordination – Support collaborations related to estuarine shoreline management, including the Coastal Habitat Protection Plan, Oyster Blueprint, Living Shoreline



Steering Committee, and with NOAA partners; in concert with state and federal partners, develop guidelines for permitting thin-layer projects; use living shorelines on Coastal Reserve sites as appropriate to improve resilience and to create demonstration sites; and encourage public landowners and facilities to use living shorelines where appropriate.



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