

# Living Shorelines in Cold Climates: Educational “Stacker” Update and Expert Interview Findings

NROC Meeting  
March 15, 2016

# Overview

## **Stacker/explainer cards product** (project through NROC)

- Project purpose
- Status
- Moving forward

## **Expert interview findings** (project through NOAA OCM)

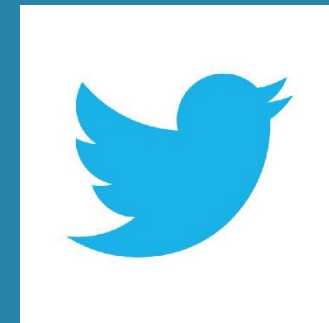
- Project purpose
- Methods
- Findings

# Stacker – Background & Purpose

- Lack of studies/information for living shorelines in cold climates
- Concurrent work to try to fill this gap (to be discussed in a few minutes)
- Create an education product targeting coastal property owners in New England

# Stacker – Wait, what’s a “Stacker”?

- Stack of “cards” which are basically like slides
- But, unlike a slideshow, stackers are fully embeddable on websites and social media:
  - [website example](#), [Twitter example](#)
- Completion rates of 60-70% as compared to video completion rates of about 35%



# Stacker – Work completed

- Developed initial content and graphics
- Presented draft storyboards at RAE Living Shorelines Workshop in December
- Several rounds of revisions



# Stacker – Current status

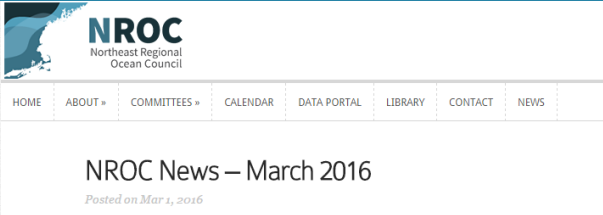
- Organizing a review and survey for a small group of coastal property owners in CT and MA
- Discussion questions:
  - Overall tone?
  - Depth of detail?
  - Any ideas for how you could use this product?

[LATEST LIVING SHORELINES STACKER](#)

# Stacker – Outreach ideas

- Embed in NROC Newsletter
- List on UConn Living Shorelines website as a resource
- Include in Living Shorelines Academy website - “Learn” section

- State CZM websites, LinkedIn, Twitter, Facebook



Home Resources & Events Journalists Coastal

## Shoreline Stories

### Welcome!

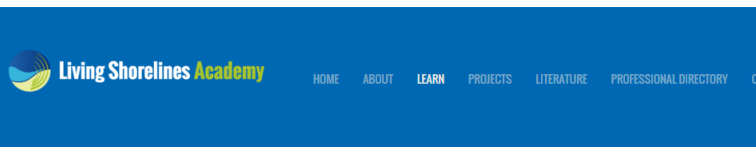
As New Hampshire looks ahead for opportunities to make our shorelines more resilient to flooding and erosion from sea-level rise and storm surges, we are launching a new **SERIES** that takes a closer look at past and ongoing approaches to coastal protection.

The shoreline stories will try to answer a few big questions:

- What does shoreline management look like on the ground?
- What types of information are considered when making decisions about coastal protection?
- What are the tradeoffs of these decisions?

We will post one story each month that showcases an example of shoreline management in New Hampshire. We encourage readers to post thoughts, pose questions, and share stories in the blog comment section. The NH Shoreline Series is sponsored by the NHDES Coastal Program, the Great Bay National Estuarine Reserve and the NH Coastal Adaptation Workgroup.

Happy Reading!



## LEARN

### TRAINING MODULES



#### LIVING SHORELINES FOR PROPERTY OWNERS

If you are a property owner looking to understand what alternatives you have to mitigate erosion on your estuarine property you will find answers in the



#### DESIGN, CONSTRUCTION AND PERMITTING OF LIVING SHORELINES

If you are a contractor or an engineer looking to better understand and learn how to design and build



# Stacker – Next steps

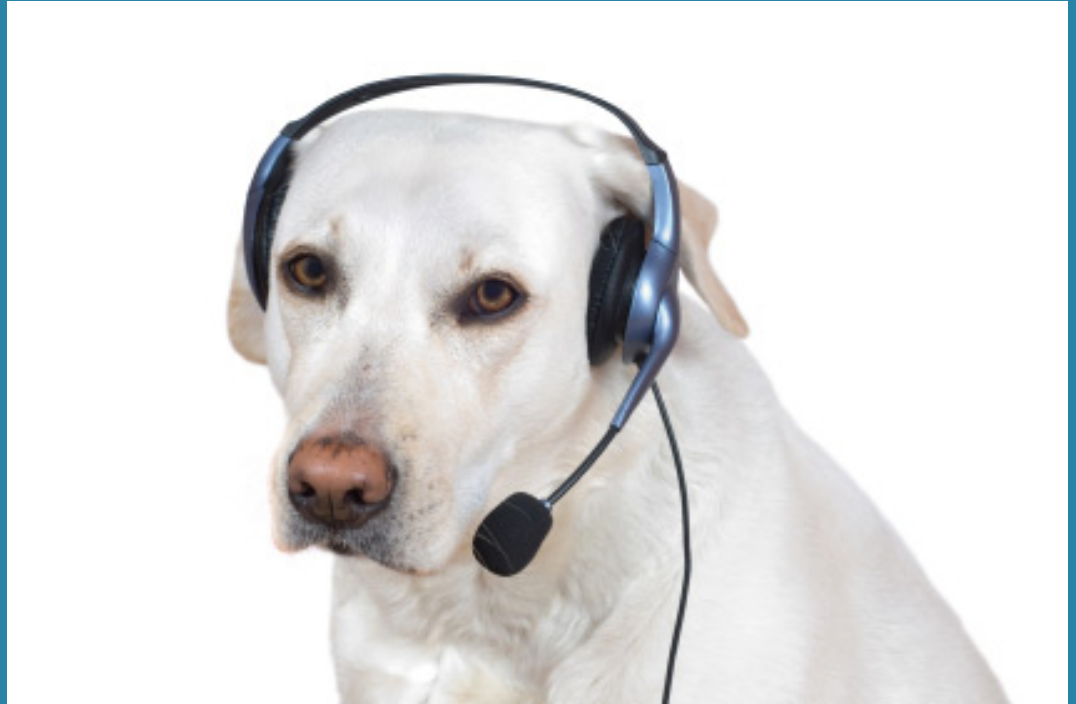
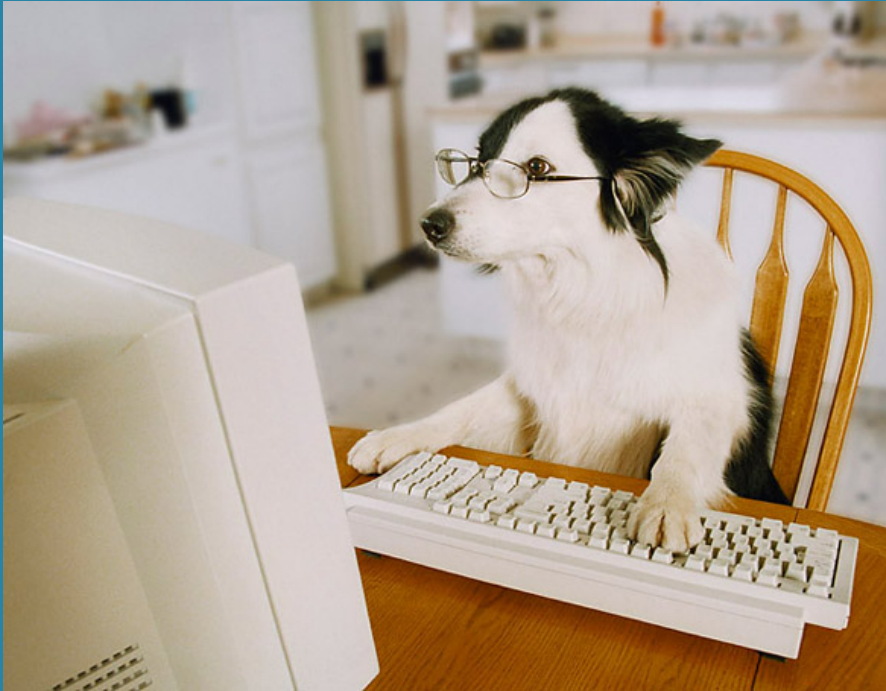
- Feedback from coastal property owners (March)
- Final updates (April)
- Soft release and analytics tracking (May)
- Adjustments (June)
- Release (June)



# Expert Interviews – Background

- Initial project was green infrastructure literature review and database development.
- Lack of literature on the application of living shorelines in cold climates.
- Interviewed eight subject matter experts with experience designing and installing living shorelines across New England, New Jersey, New York, and the Great Lakes.

# Expert Interviews - Methods



# Expert Interviews – Findings

## Current policies and trends:

- During the past five years, increasing interest in living shorelines due to events like Hurricane Sandy (2012) and initiatives like the Great Lakes Restoration Initiative (2010).
- Success and popularity in Mid-Atlantic.
- Awareness of the benefits of living shorelines is growing and cold climate state regulators are beginning to change their positions.
- More biodegradable options for living shoreline materials and more widely available.

# Expert Interviews – Findings

## Successful Practices:

- Sites affected by ice are most successfully stabilized with gentler slopes (e.g., 6:1-10:1) and/or by incorporating shrubs like marsh elder (*Iva frutescens*) and sea myrtle (*Baccharis halimifolia*).
- Where permitted, strategically placing roughened surfaces (e.g., logs and boulders) allows vegetation growth and wildlife passage while weakening ice or wave forces.
- The physical forces acting on shorelines are more severe than in the Mid-Atlantic. Thus, engineers and ecologists should collaborate in order to create well-designed projects that perform specific functions.

# Expert Interviews – Findings

## Obstacles/challenges:

- Wildlife herbivory
- Seawalls/other structures prevent re-grading of slope for plantings
- The winter freezing process can damage or destroy oyster castles and other artificial reef structures
- Boat wakes
- Beach recreation
- Lack of regulatory support for approaches such as stone sills, shellfish reefs, and temporary off-shore breakwaters
- Public perception
- Lack of monitoring

# Expert Interviews – Findings

## Gaps (research and other):

- Long-term monitoring of project success and ecological function
- No real formal living shoreline design guidance or best practices manual that exists for cold climates
- Material and technique studies on:
  - Using boulders or rocks and/or wood pilings to break up ice successfully
  - Performance of fiber/coir roll in varying storm energies and comparisons of various anchoring techniques
  - Viability of oysters and mussels as options for shoreline protection
  - Dissipation of wave energy

# Expert Interviews – Recommendations

- Future research agenda
- Training and guidance development
- Centralize existing project information
- Funding for monitoring
- Monitoring protocol
- Cold climate checklist
- Outreach and education

TABLE 1. VEGETATIVE TREATMENT POTENTIAL FOR ERODING TIDAL SHORELINES IN THE MID-ATLANTIC STATES

DIRECTION FOR USE				
1. Evaluate each of the first four shoreline variables and match the site characteristics of the variable to the appropriate descriptive category. 2. Place the Vegetative Treatment Potential (VTP) assigned for each of the four variables in the right hand column. 3. Obtain the Cumulative Vegetative Treatment Potential for variables 1, 2, 3 & 4 by adding the VTP for each. 4. If it is 23 or more, the potential for the site to be stabilized with vegetation is very good and the rest of the table need not be used. If it is below 23, go to step 5. 5. Determine the VTP for shoreline variables 5 through 9 and obtain the cumulative VTP score. 6. Compare the cumulative VTP score with the Vegetative Treatment Potential for the site.				
SHORELINE VARIABLES	DIRECTION The Vegetative Treatment Potential is Located in Upper Left			
1. Patch: Average distance in miles of open water measured perpendicular to the shore and 45° either side of perpendicular to shore.	8 Less than 0.5 miles	7 0.5 thru 1.4 miles	6 1.5 thru 3.4 miles	5 Greater than 3.4 miles
2. General shape of shoreline for distance of 200 yards on each side of planting site.	8 Coves	7 Irregular	6 Straight	5 Pointed
3. Shoreline orientation: General geographic direction the shoreline faces.	4 Any orientation less than one-half mile fetch	3 West to North	2 South to East	1 North to West
4. Boat Traffic: Proximity of site to recreational & commercial boat traffic	5 None	3 1-10 per week within 1/2 mi. of shore	2 10 per week within 1/2 mi. of shore	1 More than 10 per week within 1/2 mi. of shore
Cumulative Vegetative Treatment Potential If this score is 23 or above, the potential for the site is very good. If it is below 23, go to step 5 below.				
5. Width of Beach Above Mean High Tide in Feet	3 Greater than 10'	2 10' thru 7'	1 7' thru 3'	0 Less than 3'
6. Potential width of Planting Area in Feet	3 More than 20'	2 20' thru 15'	1 15' thru 10'	0 Less than 10'

## A Framework for Standardized Monitoring of Living Shorelines in the Delaware Estuary and Beyond

Danielle Kreeger and Joshua Moody  
Partnership for the Delaware Estuary – DRAFT 4/22/14

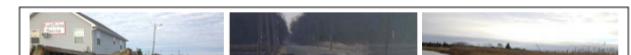


### I. Introduction

Living shorelines represent a promising new approach to stabilize eroding shorelines, enhance ecological health, and promote water quality along coastal areas that are increasingly challenged by sea level rise, boat traffic, degraded water quality, and increased storm severity (among other stressors). In comparison to traditional tactics to stabilize shorelines such as bulkheads and rip rap, living shorelines support essential ecological connectivity including hydrologic exchange and biotic use, while also taking advantage of the natural resilient properties of healthy ecological assemblages (PDE 2012a). For more information about living shorelines, please see: <http://www.delawareestuary.org/living-shorelines>.

Since 2007, the Partnership for the Delaware Estuary (PDE) has worked jointly with the Haskin Shellfish Research Laboratory at Rutgers University to study whether and how living shorelines can be developed for the Mid-Atlantic region. We have developed new tactics that utilize native fauna and flora (PDE 2011), and have also explored the use of tactics practiced elsewhere but which have not yet been tested in our area due to limited funding. We have also assisted state and federal managers in developing new permitting rules to ease the path for future living shorelines, and we have prepared conceptual designs for dozens of new projects to serve as demonstration sites for contractor training and public outreach, pending funding (e.g., PDE 2012b, c).

Currently, interest in living shoreline tactics is rapidly growing within the Delaware Estuary and beyond, largely spurred by lessons learned from Hurricane Sandy. Built infrastructure that was buffeted by natural habitats such as coastal wetlands and beach dunes appeared to suffer far less damage than properties adjacent to areas where those natural habitats had been compromised (Figure 1). Numerous studies are in progress to quantify and compare the various costs and benefits of natural habitats, living shorelines, and traditional hard tactics such as rip rap and bulkheads. In the Delaware Estuary, approximately an acre per day of coastal wetlands are vanishing (PDE 2012 d, e), and living shorelines are increasingly viewed as one of several new approaches that may help to stem this loss of resilient natural infrastructure.



# THANK YOU!

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