Maryland's Shorelines: Planning for the Future

Maryland Department of Natural Resources

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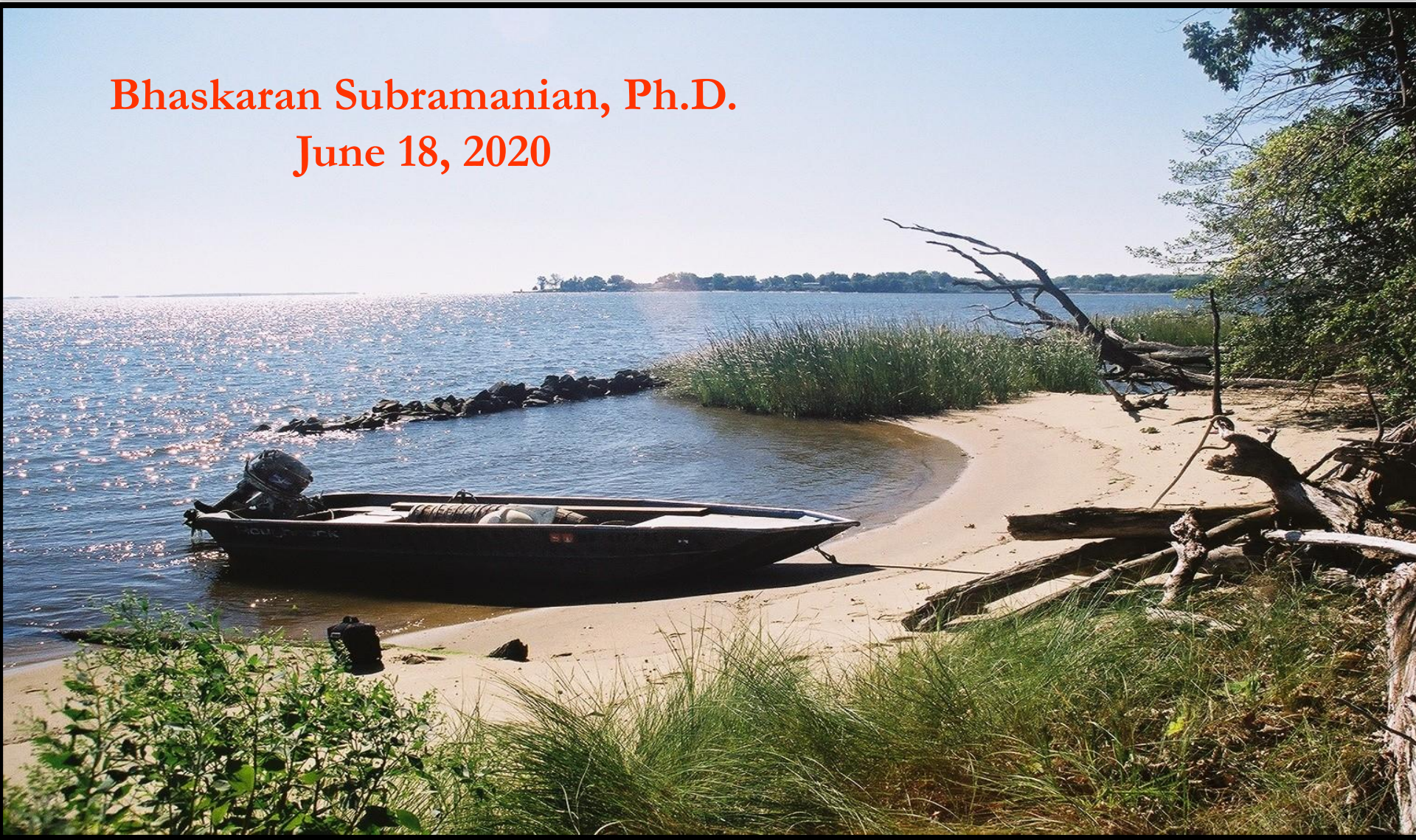
June 18, 2020



Primer on Erosion

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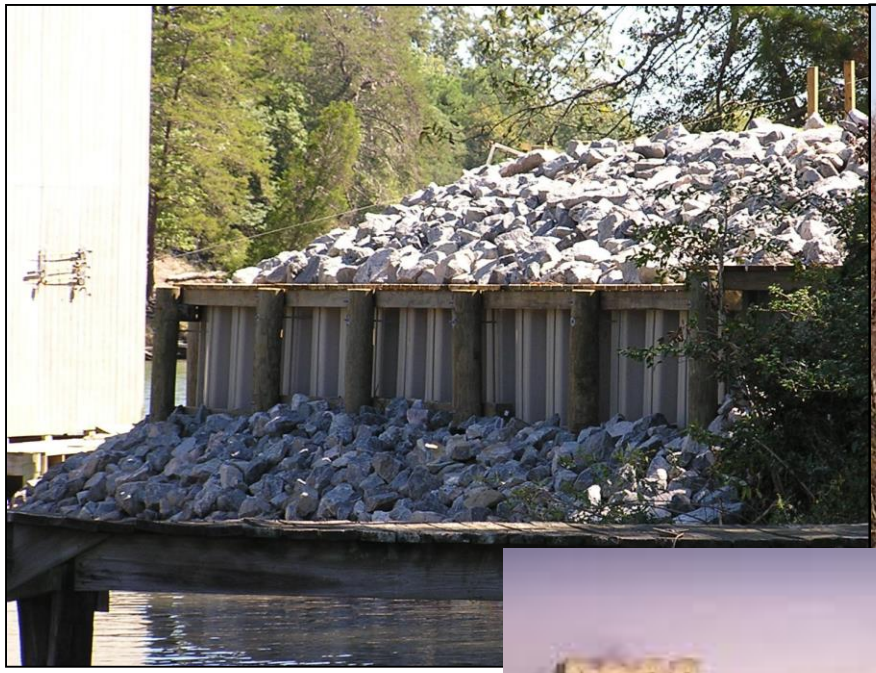
- Erosion Is Not a Bad Thing!!
- Erosion happening in all 16 coastal counties of MD

Traditional Methods of Erosion Control

Rip-rap or Revetment

Wooden Bulkhead

Going overboard ??



Great Wall of China

Problems Associated with "Structural" Approach

Fighting nature instead of working with it!!

Comprehensive Shoreline Assessment

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Rate of change	Shoreline Length	
	Miles	%
Accretion	2,006	30
No Change	75	1
Slight erosion 0 to -2 feet/year	3,740	56
Low erosion -2 to -4 feet/year	618	9
Moderate erosion -4 to -8 feet/year	173	3
High erosion Over -8 feet/year	48	1
Total	6,659	100

Living Shorelines: Working with nature

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- Shoreline Protection
- Habitat
- Aesthetics
- Coastal Resilience

What Kind of Living Shoreline Project is the Best?

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- One size **DOES NOT** fit all!!

- Energy Regime
- Project Objective(s)
- Site Conditions

Shoreline Conservation Service: 1968-2018

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Items	Structural Projects	Living Shoreline Projects
# of Projects	484	480
LF of shoreline protected	201,649	202,050
Sq ft of marsh created	12,412	3,859,855
Amount of State loans	$31,511,944	$3,990,381

How are MD Projects doing?

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- Assessment study analyzed:
  - Marsh erosion
  - Structure condition
  - Non-planted vegetation

Results

- Out of 177 projects, **131** of them were good or better.
- Maintenance- Crucial for the success of a project.

Switching gears…. To Hurricane Isabel and beyond

Building Resilience to Climate Change: Investing in Nature

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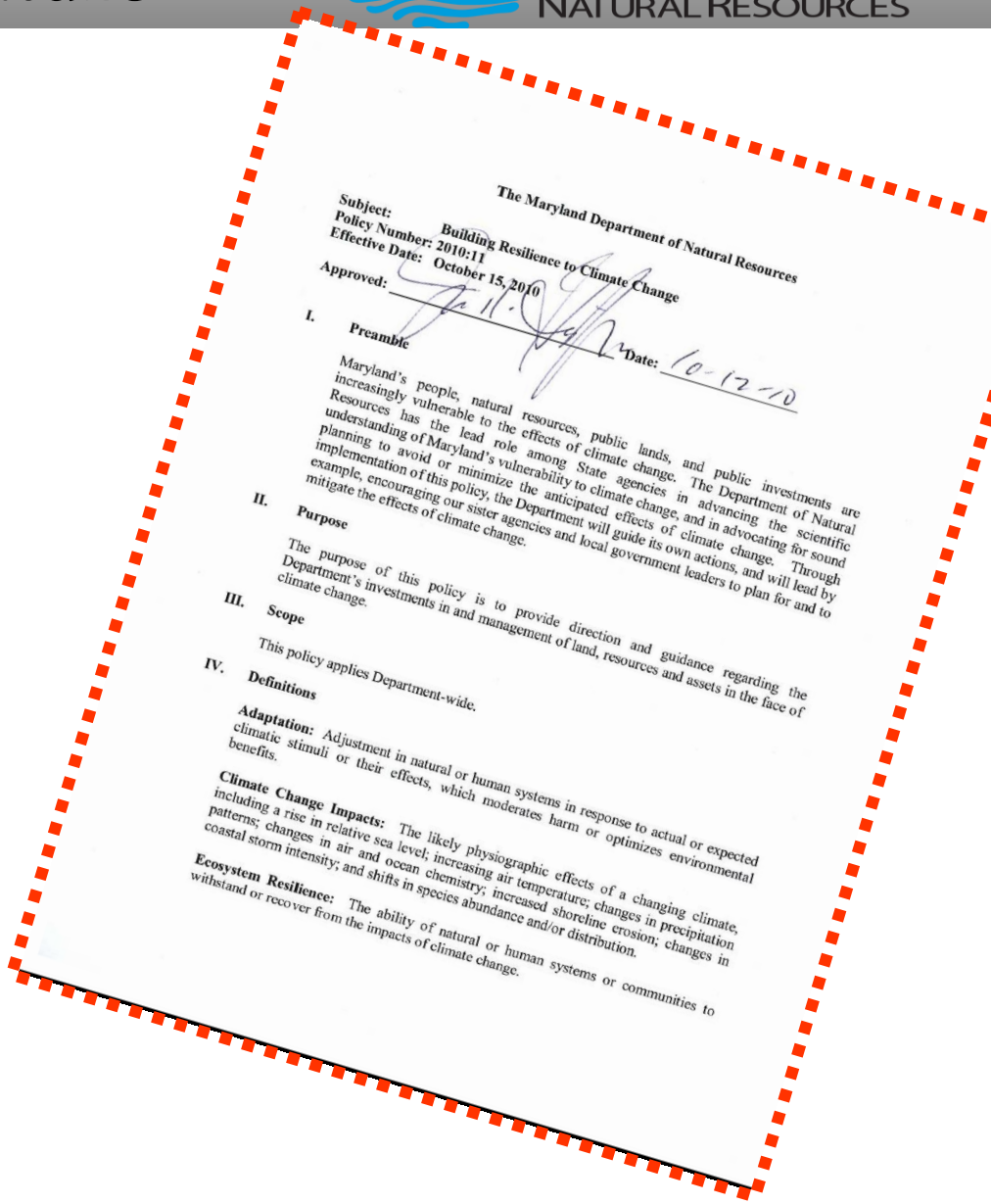
- Enhance the resilience of bay, aquatic and terrestrial ecosystems and/or increase on-site carbon sequestration.
- Incorporate factors associated with climate change in all phases of project.
- Compile a compendium (*shortlist*) of BMPs for habitat restoration project design.
- Conduct a GIS-based audit of DNR-owned lands to identify habitat restoration potential for enhancing ecosystem resilience and/or increasing carbon sequestration.



The Maryland Department of Natural Resources

Subject: Building Resilience to Climate Change
Policy Number: 2010:11
Effective Date: October 15, 2010
Approved: _____ **Date:** 10-12-10

I. Preamble

Maryland's people, natural resources, public lands, and public investments are increasingly vulnerable to the effects of climate change. The Department of Natural Resources has the lead role among State agencies in advancing the scientific understanding of Maryland's vulnerability to climate change, and in advocating for sound planning to avoid or minimize the anticipated effects of climate change. Through implementation of this policy, the Department will guide its own actions, and will lead by example, encouraging our sister agencies and local government leaders to plan for and to mitigate the effects of climate change.

II. Purpose

The purpose of this policy is to provide direction and guidance regarding the Department's investments in and management of land, resources and assets in the face of climate change.

III. Scope

This policy applies Department-wide.

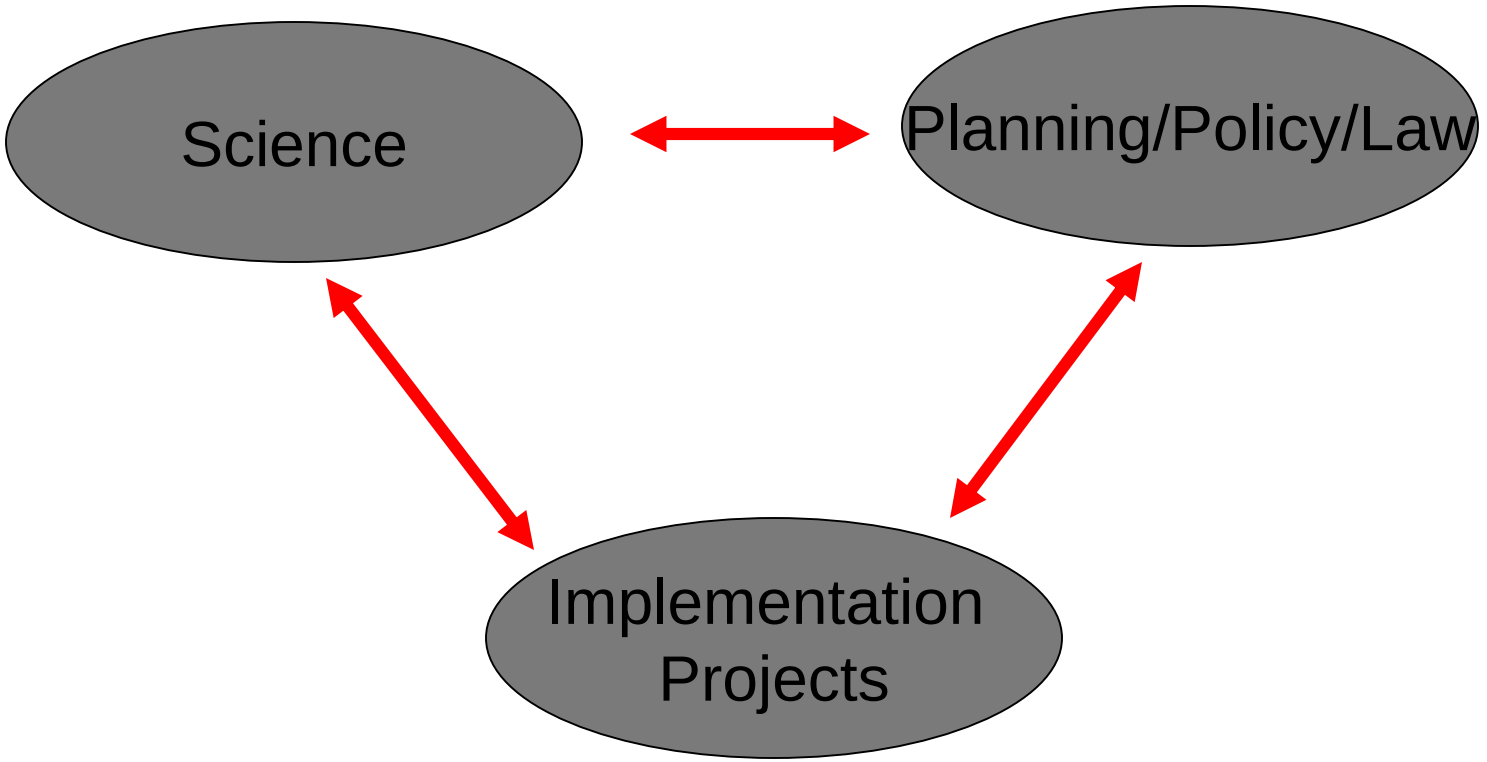
IV. Definitions

Adaptation: Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or optimizes environmental benefits.

Climate Change Impacts: The likely physiographic effects of a changing climate, including a rise in relative sea level; increasing air temperature; changes in precipitation patterns; changes in air and ocean chemistry; increased shoreline erosion; changes in coastal storm intensity; and shifts in species abundance and/or distribution.

Ecosystem Resilience: The ability of natural or human systems or communities to withstand or recover from the impacts of climate change.

MD-DNR's Coastal Adaptation Policy



Confluence of Science, Policy, Planning & Implementation!!

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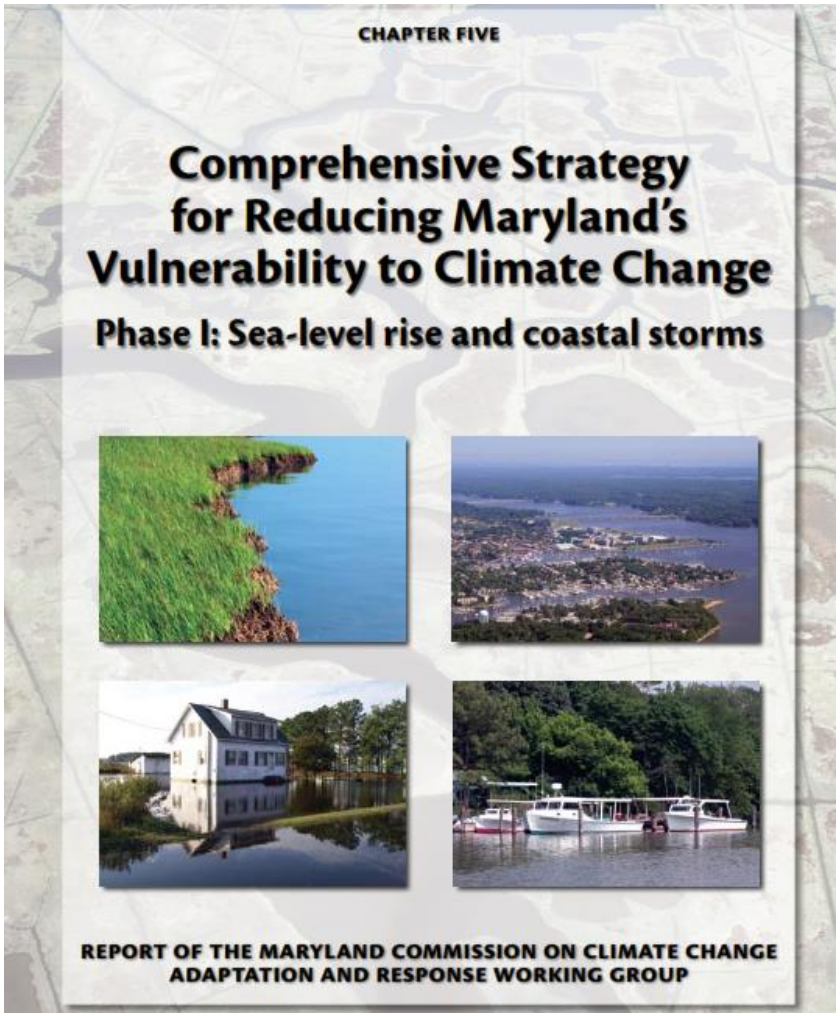

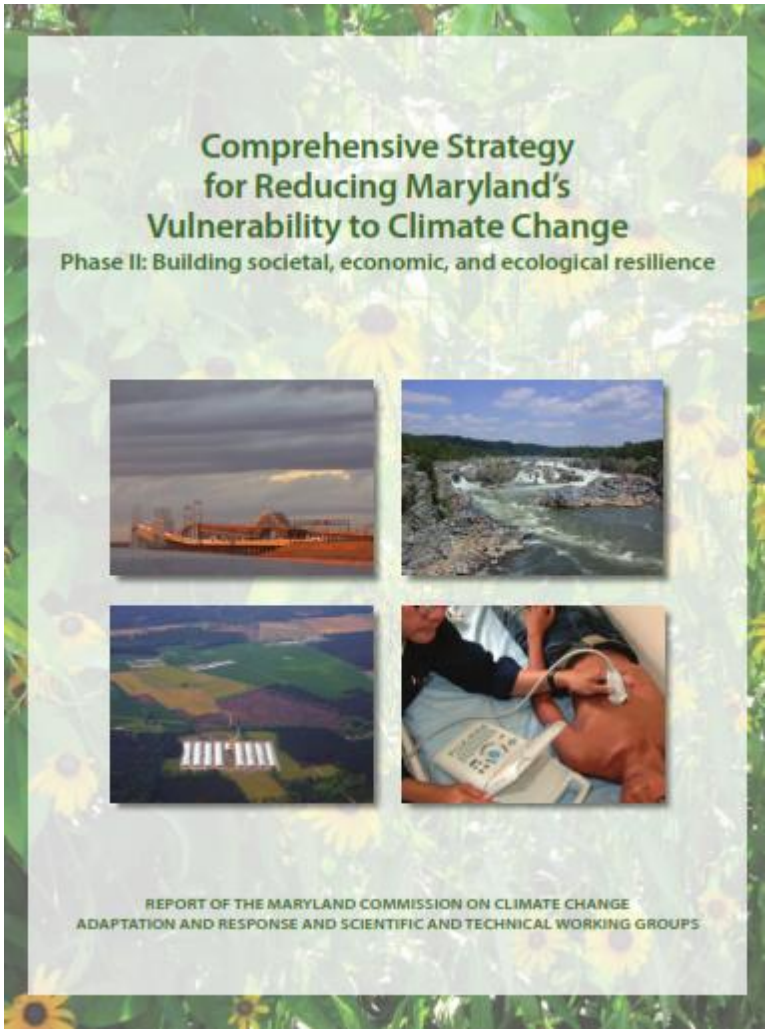

Confluence of Science, Policy, Planning & Implementation!!

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SHORE PROTECTION

A Guide for Engineers and Marine Contractors Working in the Chesapeake Bay Region

2013

U.S. Army Corps of Engineers
Maryland Department of Natural Resources

This information is presented as a public service. Inclusion of any shore protection device or method does not necessarily constitute a government recommendation or endorsement, nor is it guaranteed that any particular method will be successful for a specific application.

CCS HABITAT RESTORATION AND CONSERVATION DIVISION:
BUILDING RESILIENCE THROUGH HABITAT RESTORATION

Bay marsh meets Nor'easter. Photo courtesy of Chris Bason, Center for the Inland Bays.

Maryland Department of Natural Resources
Chesapeake and Coastal Service

October 2014

DISCLAIMER: This white paper is a guidance document for restoration planning, implementation, and project management within Maryland Department of Natural Resources' Chesapeake and Coastal Service. As such, it is a living document which will grow and change with advancing science and restoration techniques.

Building resiliency through restoration… was born!!

Resiliency Through Restoration (RtR)

- Resiliency through Restoration (RtR) Initiative- a new effort- launched in FY-2018.
- Goals- to build community and ecological resilience throughout the Maryland with nature-based adaptation solutions.
- Investing in natural features like wetlands, forest buffers, dunes, and living shorelines.
- With natural buffers in place, communities will be better able to bounce back following climate-related events.

Components of RtR

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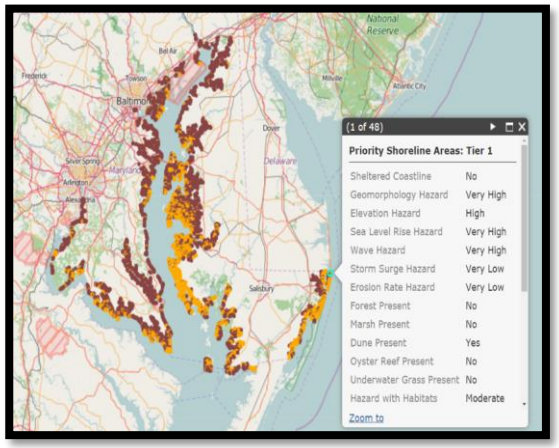
1. **Targeting using Coastal Resiliency Assessment**
   - Identify vulnerable coastal communities
   - Identify locations where nature can help reduce risk
2. **Community Resiliency Grant Program**
   - Technical and financial assistance
   - Protect residents, economies, infrastructure and public resources.
3. **Innovative Climate-Resilient Designs**
   - Tidally influenced sites (SLR, marsh migration, storm surge, etc.)
   - Non-tidal/inland sites (Precipitation, streamwater flow, etc.)
4. **Monitoring for Maintenance & Adaptive Management**
   - Identify physical, chemical and biological metrics
   - Improve design with changing conditions
5. **Outreach, Communication & Education**



Coastal Resiliency Grant Program

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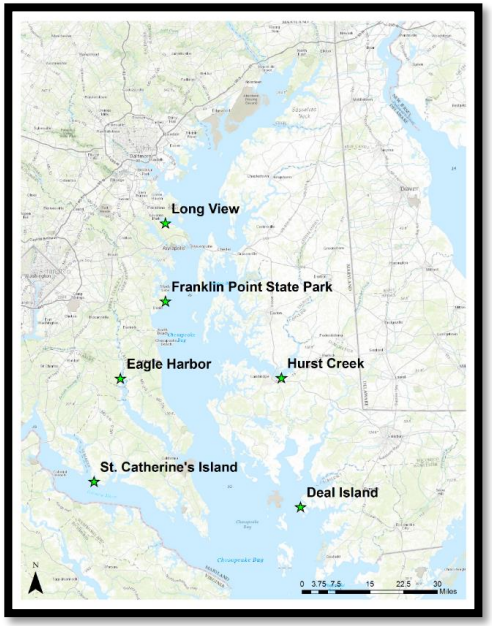
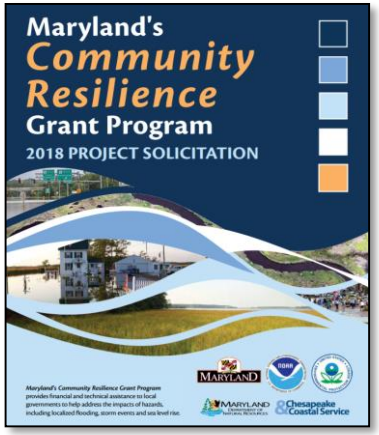
- **Eligible Projects:**
  - **Year 1:** Natural and nature-based shoreline stabilization and coastal flood reduction projects.
  - **Year 2:** Expansion to upland/non coastal communities with stormwater and/or floodplain climate impacts

- **Community Resilience Grant Solicitation**
  - Phase 3: Implementation
  - 22 requests (over $1.6 M)
  - Design/permitting
  - Future funding: construction, adaptive management



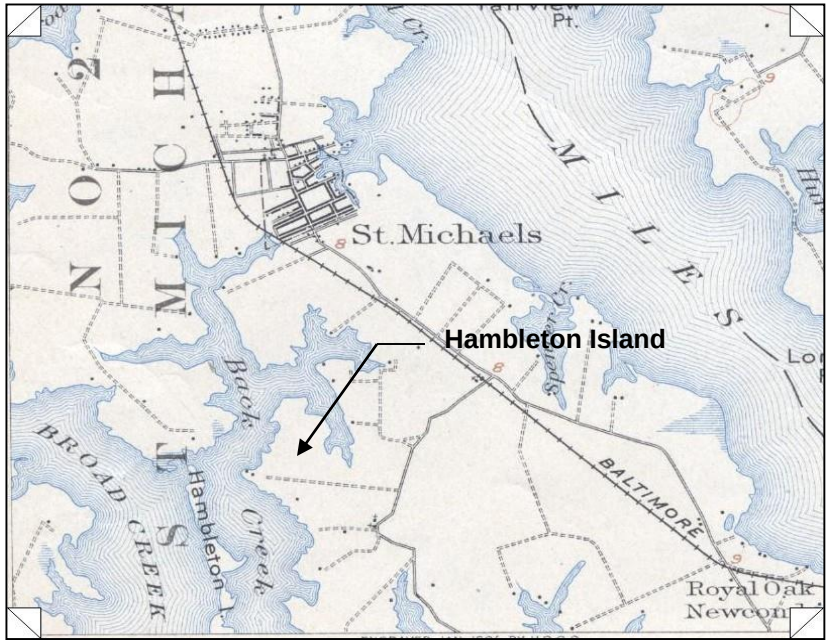


Closer Look at Living Shorelines

Edgar W. Garbisch

- Founded Environmental Concern (St. Michael's, Maryland) in 1972.
- Wrote The Do's and Don'ts of Wetlands Construction: Creation, Restoration & Enhancement.
- One of the first large marsh/shoreline restoration projects at Hambleton Island in Talbot County.

1904 USGS Map



"His work is interesting, but I don't want to see him running around the country like Johnny Spartinaseed."

- John Clark (Conservation Foundation)

Evolution of Living Shorelines

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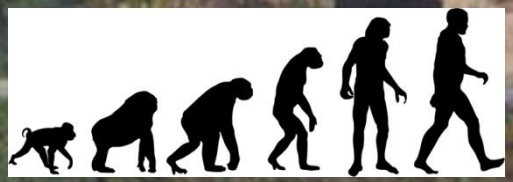
High-profile sills with no gaps



Fiber Glass Boat Analogy:

"*Less is More*"

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Hail Cove Project, Kent Co, MD

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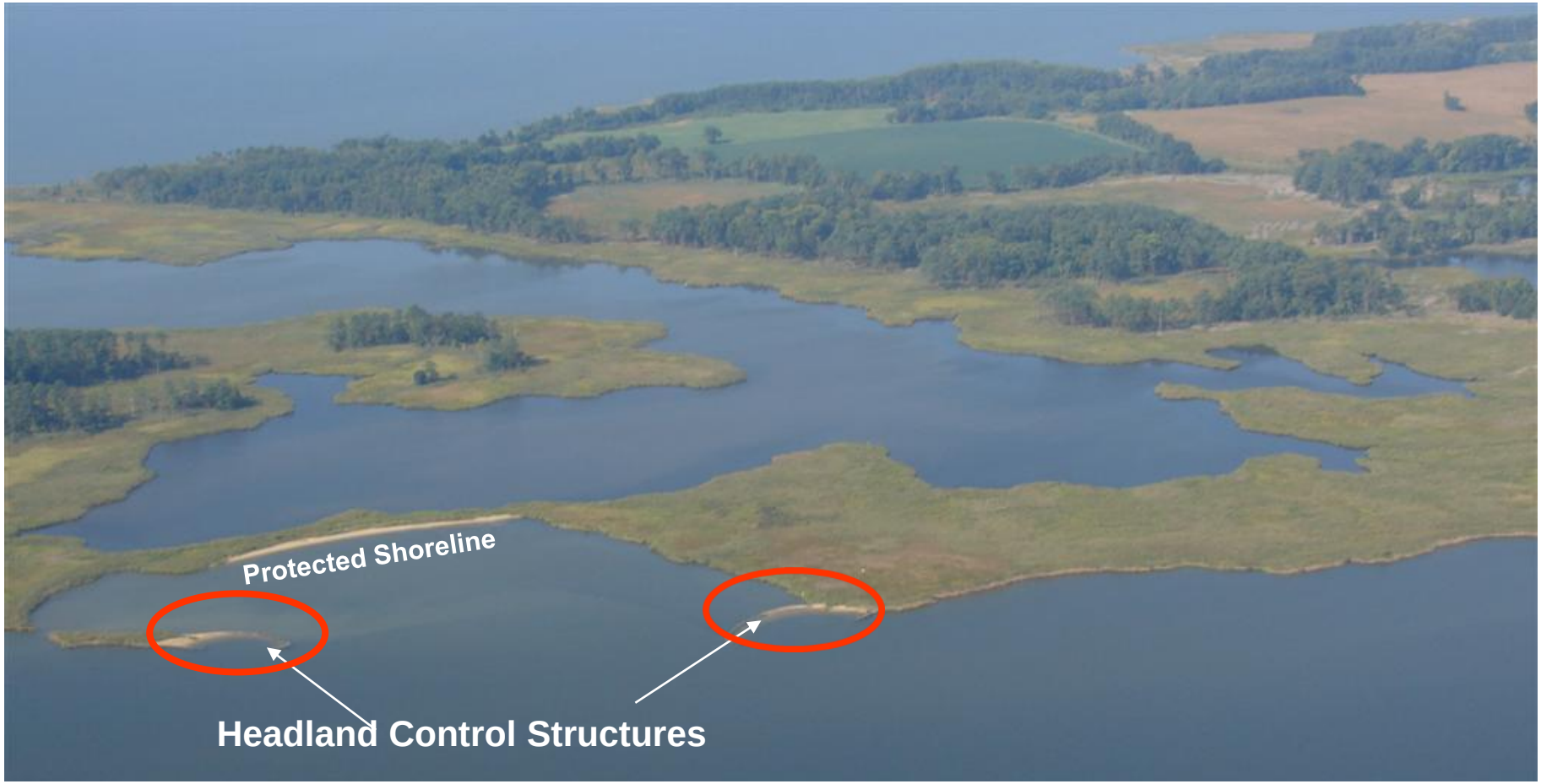

Spaniard Point, Centreville, MD

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Before…

After

Completed: April 2010

Cost: $131,167

Cost/Linear feet: $205

Windy Hill Farm, Centreville, MD

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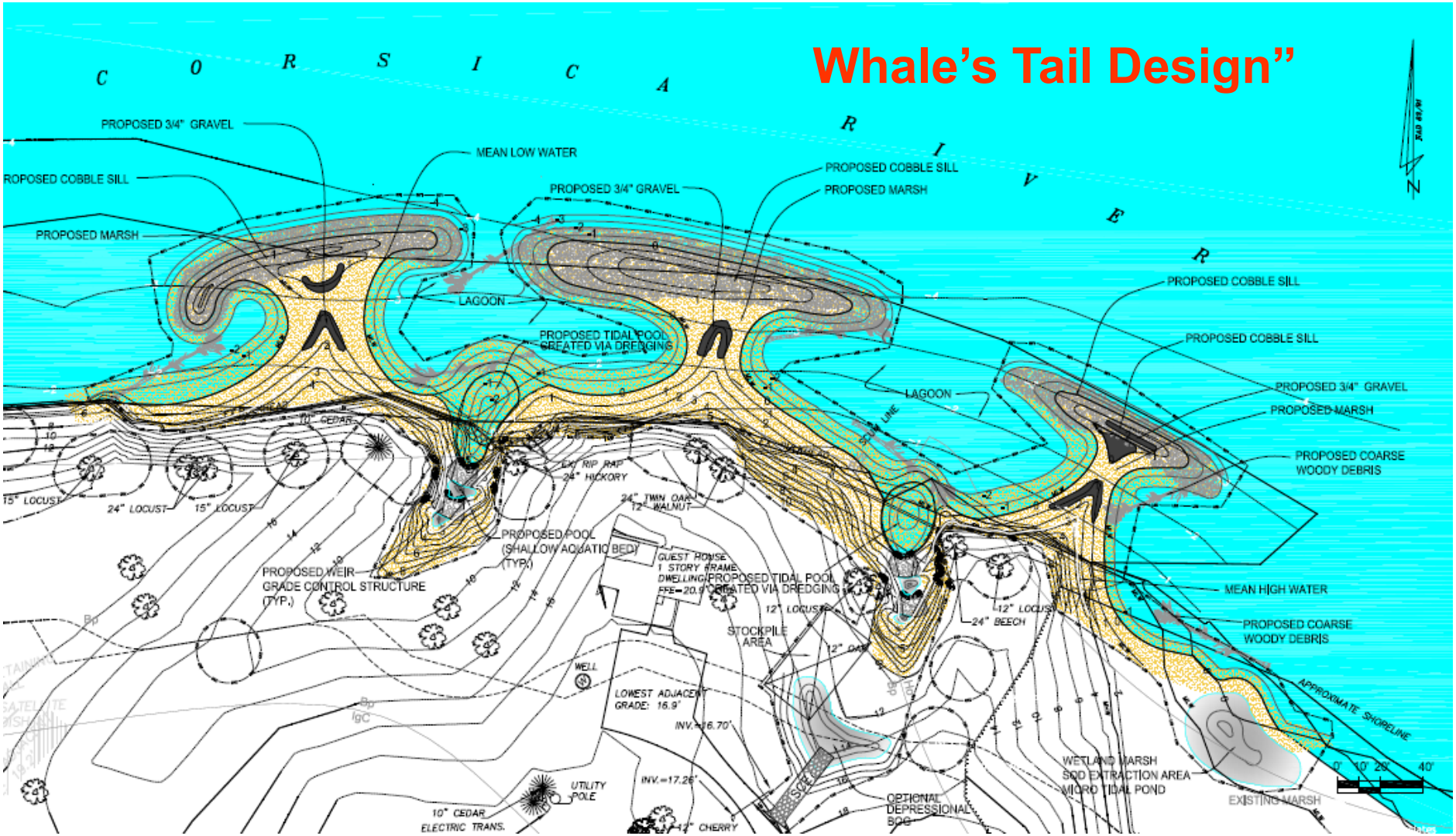

Windy Hill Farm, Centreville, MD

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Before…

After

Completed: July 2010

Cost: $226,302

Cost/Linear feet: $326

Windy Hill Farm, Centreville, MD

Gunston School LS Project:

First Project in the US to incorporate SLR into the design

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"Wishbone Design"

Completed: August 2013

Cost: $115,000

Cost/Linear feet: $144

NextGen Project: Crucial Next Step in the Evolution of LS Projects

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USACE Study: Alternative #1
Estimate- $1.5 mn

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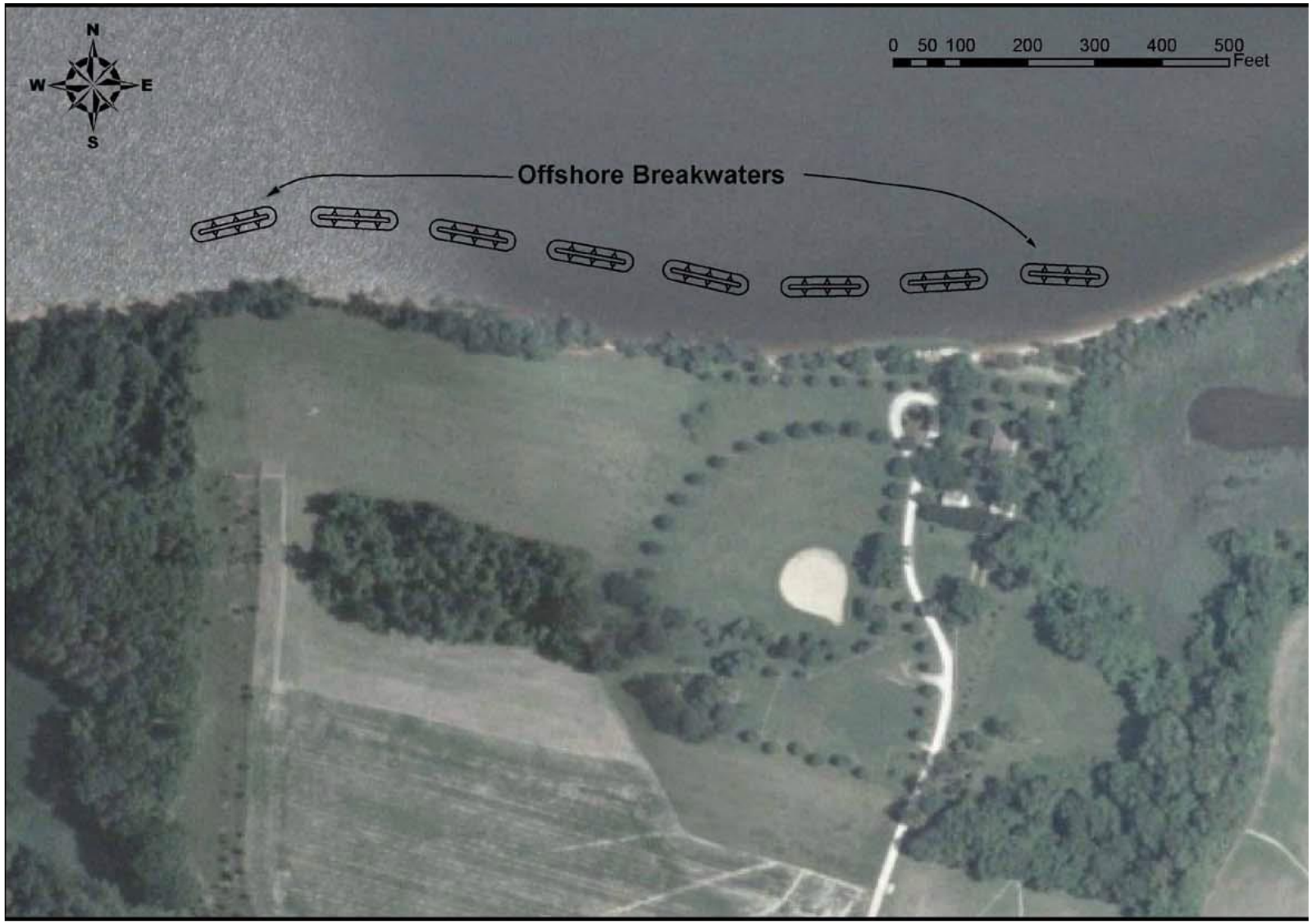

USACE Study: Alternative #2
Estimate- $1.1 mn

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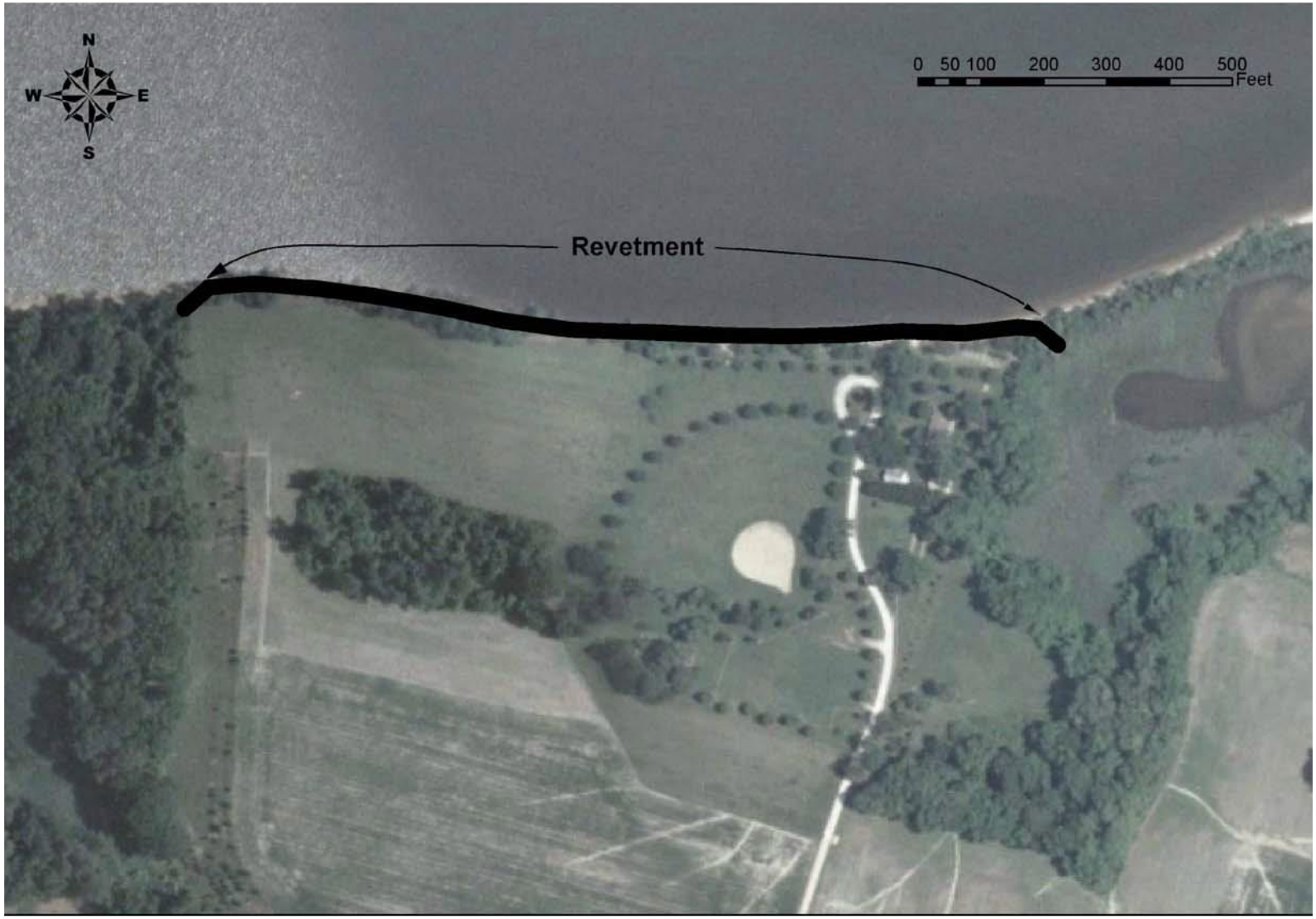

USACE Study: Alternative #3
Estimate- $1.8 mn

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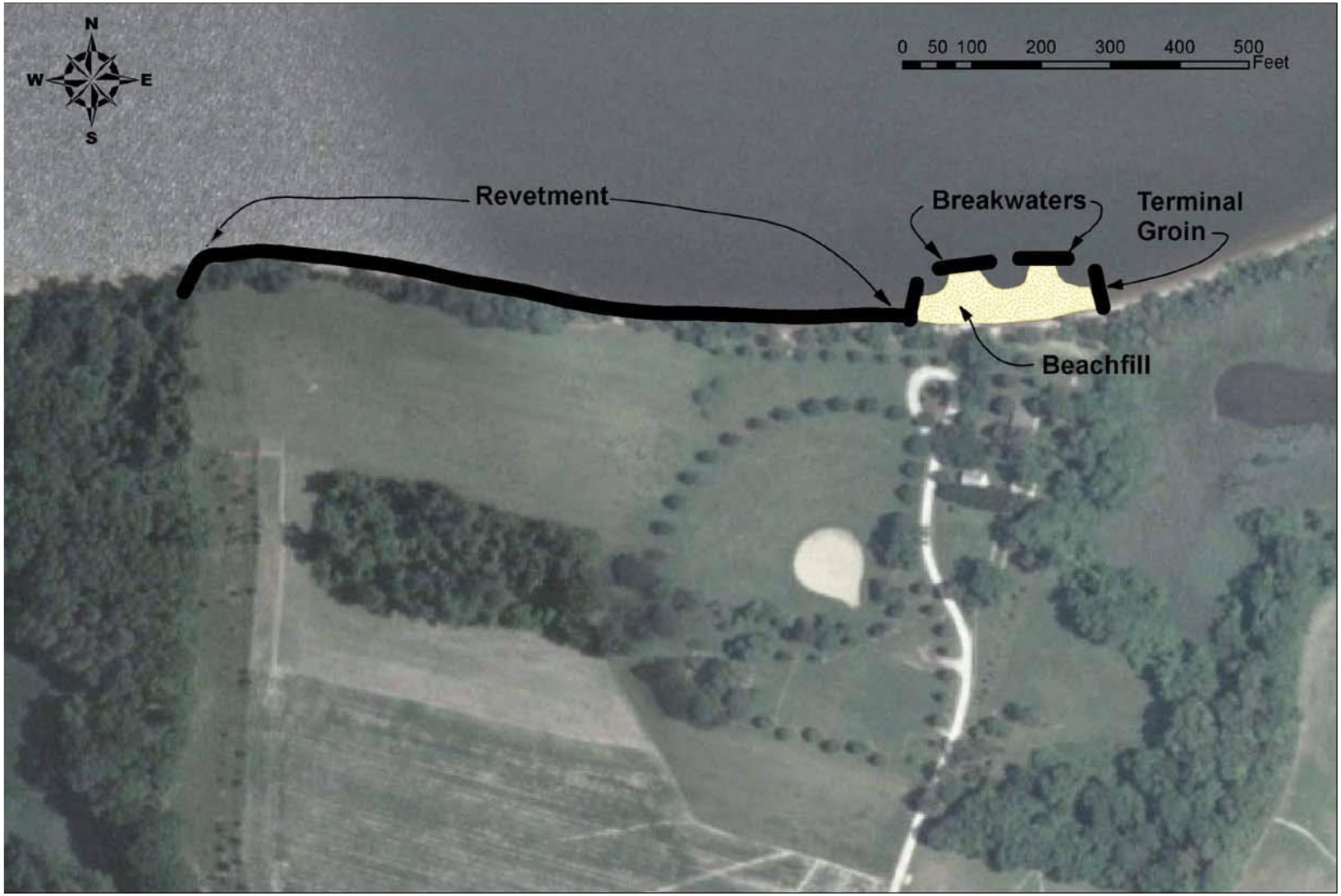

DNR Concept Plan
Estimate- $360,409

Conquest Preserve Living Shoreline Project

Before…

Completed: August 24, 2016

Cost: $271,473

Cost/Linear feet: $232

After

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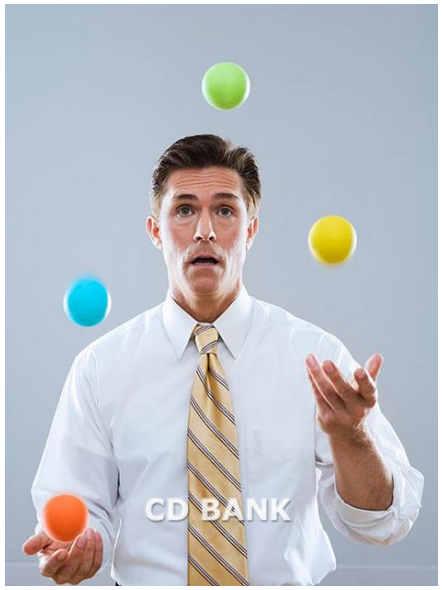
Take-Home Message



Vs.

Tool should match the objective/goal

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

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