A Turnkey Approach to Nature Based Tidal Wetland Conservation and Enhancement

Guinea Marsh Shoreline Protection and Oyster Restoration Plan

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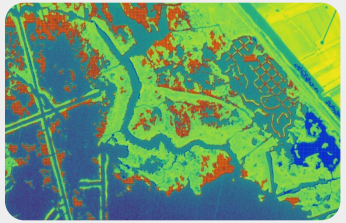
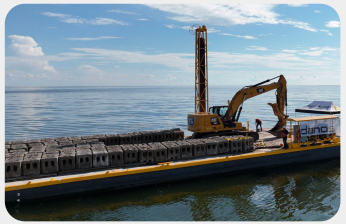
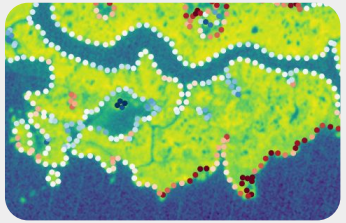
The Natrx Platform



Assess:
Remote risk assessment, analysis, planning, and design



Address:
Dry Forming™ advanced manufacturing and deployment



Appraise:
Monitoring, measurement, and reporting of project performance and value creation

Project Overview

Objective	Develop a comprehensive tidal wetland restoration and conservation design plan for permitting and implementation funding requests
Focus	Low to medium wave energy areas within the Guinea Marsh System suitable for oyster habitat enhancement
Funding Source	NOAA Chesapeake Bay Office as part of Middle Peninsula Habitat Focus Area efforts

Guinea Marsh System, Mobjack Bay, VA

Key Project Stakeholders

NOAA

VIRGINIA DWR

MIDDLE PENINSULA • CHESAPEAKE BAY PUBLIC ACCESS AUTHORITY
ESTABLISHED 2003

VMRC
Virginia Marine Resources Commission

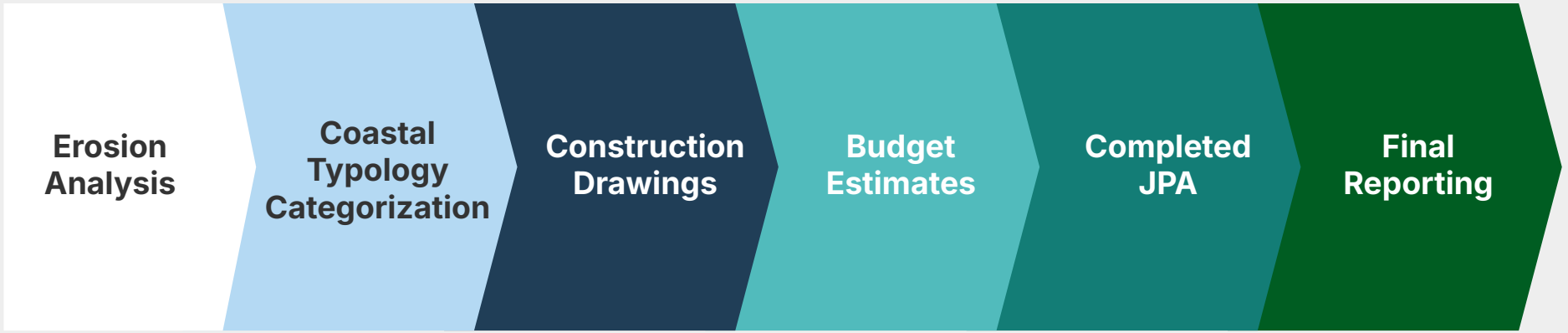
YORK RIVER & SMALL COASTAL BASIN ROUNDTABLE

Green Fin Studio

Desired Outcomes

- Protect from erosion and stabilize land loss
- Enhance oyster and fisheries habitat
- Enhance recreational opportunities
- Improve water clarity and quality
- Strengthen ecosystem and community resilience
- Preserve blue carbon storage and sequestration capacity

Scope of Work



Synthesized Shoreline Information

Property:

DWR

MPPA

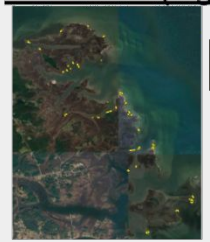
Shoreline Typology:

Steep

Shallow

Intermediate

Vulnerable (e.g., spits):



Potentially vulnerable

Erosion Rates:

high (>5 ft/year)

medium (2 to 5 ft/year)

low (1 to 2 ft/year)

very low (< 1 ft/year)

Wave Energy:

Low

Medium

Outside

Conflict (SAV or Lease):

Yes

No

SAV

Private Lease

Clams

Final Site Selection

- ➔ Output from desktop analysis
- ➔ Input from local stakeholders
- ➔ Determined 9 priority sites

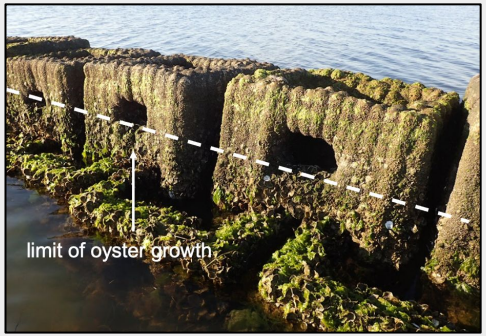
Design Criteria & Process

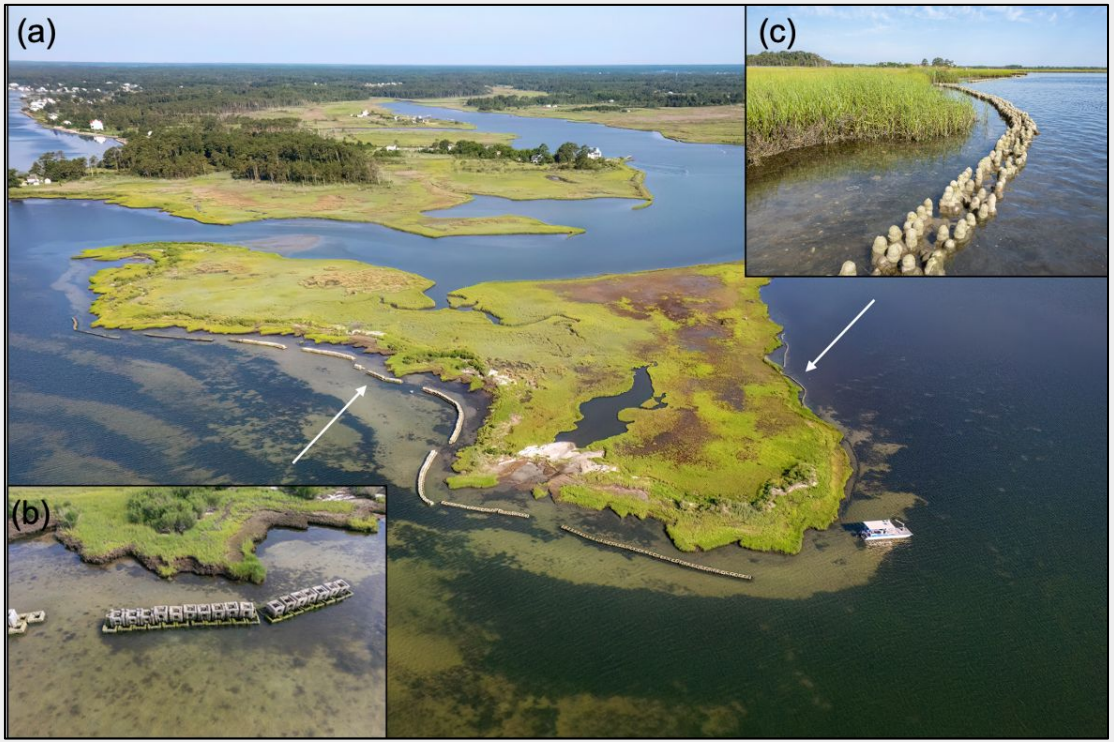
Design Objectives

- Reduce wetland loss
- Foster oyster growth
- Account for sea-level rise

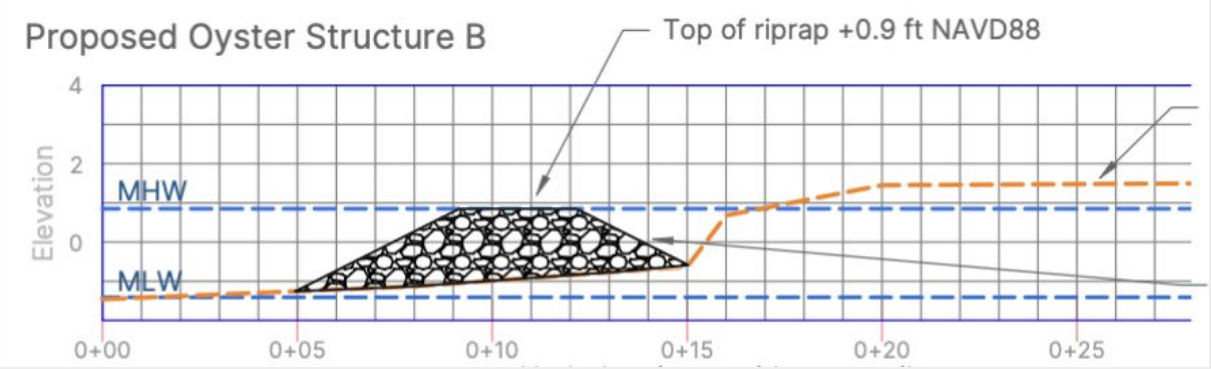
Key Criteria

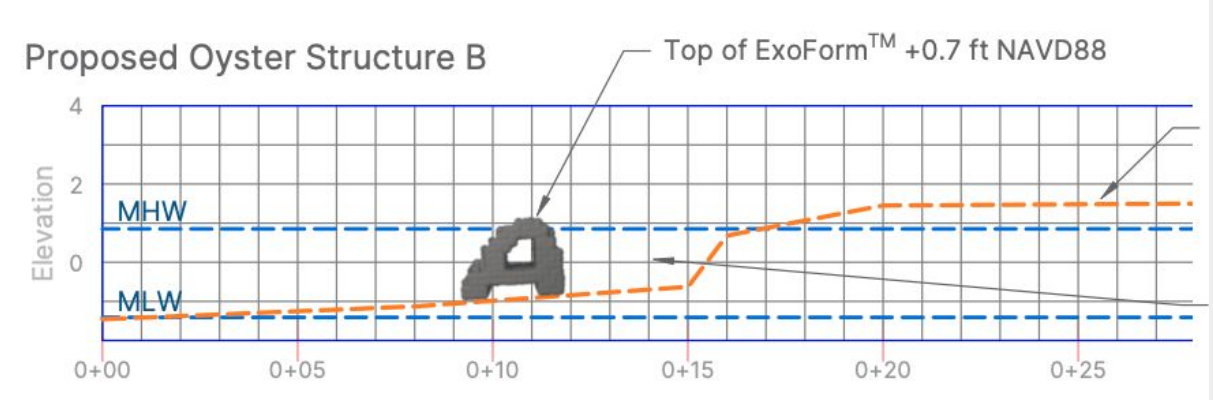
- Target Crest Elevation
- Bottom Contour(s)



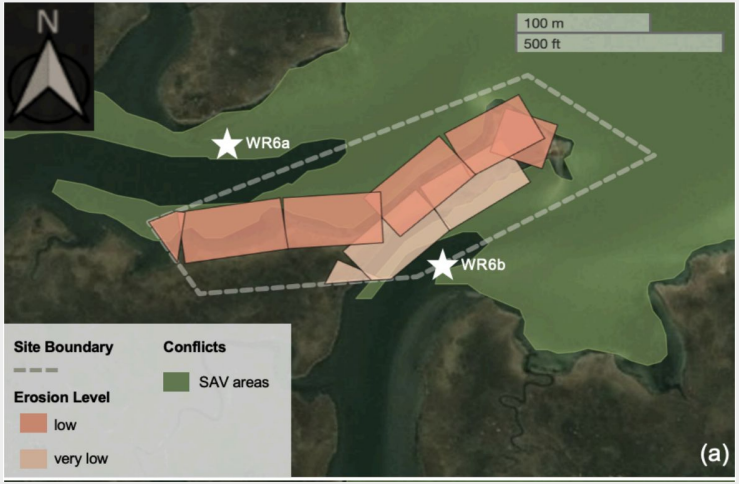


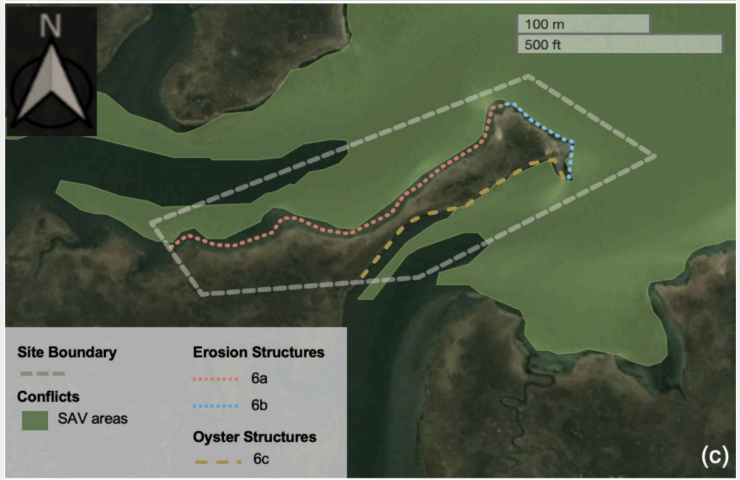
Construction Cross Sections





Design Outputs



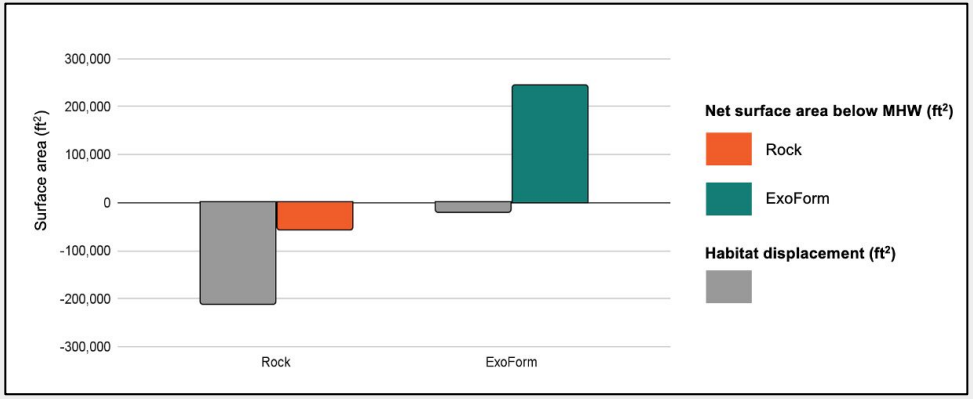


Site	Segment	Length (ft)	Contour (ft)	Crest (ft)	ExoForm Quantity	Footprint (ft^2)	Surface Area below MHW (ft^2)	Installed Cost
6	6a	1,005	-1.0	1.8	346	969	14,300	$429K
6	6b	290	-1.3	1.5	100	280	4,803	$124K
6	6c	646	-0.5	1.0	223	624	6,510	$224K

Ecological Considerations

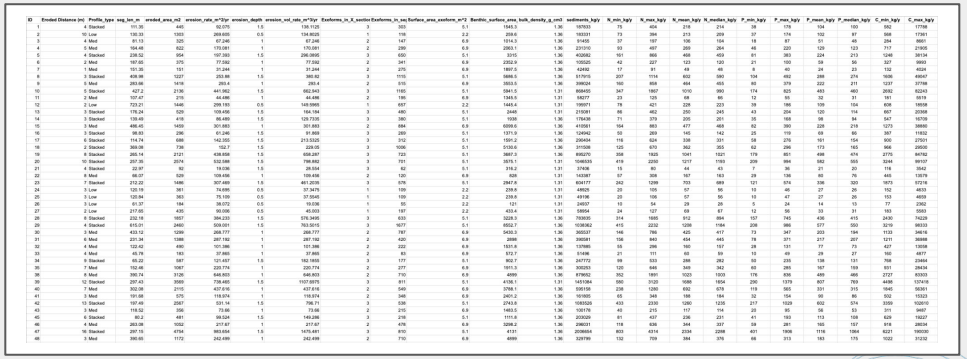
Net Habitat Impact

- Benthic Displacement
- Net Surface Area below MHW



Co-Benefits Reporting

- Sediment
- Nitrogen
- Phosphorous
- Carbon “Stop Loss”



Learnings and Next Steps

Consideration	Key Benefit
Cost	Purpose-built technology drives efficiency
Speed	< 6 months
Flexibility	Customize focus areas to stakeholder priorities
Stakeholders	Support practitioners and resource constrained constituencies
Outputs	Enable data driven downstream capabilities
Budget	Optimize finite budget resources and ROI
Permitting	Increase permit quality and shorten timelines
Funding	Improve proposal quality and increase likelihood of success

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