

Living Shoreline Implementation in Maryland

Nicole Carlozo

Maryland Department of Natural Resources



Not only do Living Shorelines defend land against destructive waves, but they also provide crucial habitat for fish and wildlife.

What is a Living Shoreline?



A SHORELINE THAT IS MADE OF NATURAL MATERIALS SUCH AS PLANTS, SAND, OR ROCK THAT CREATES, PROTECTS, AND RESTORES HABITAT.

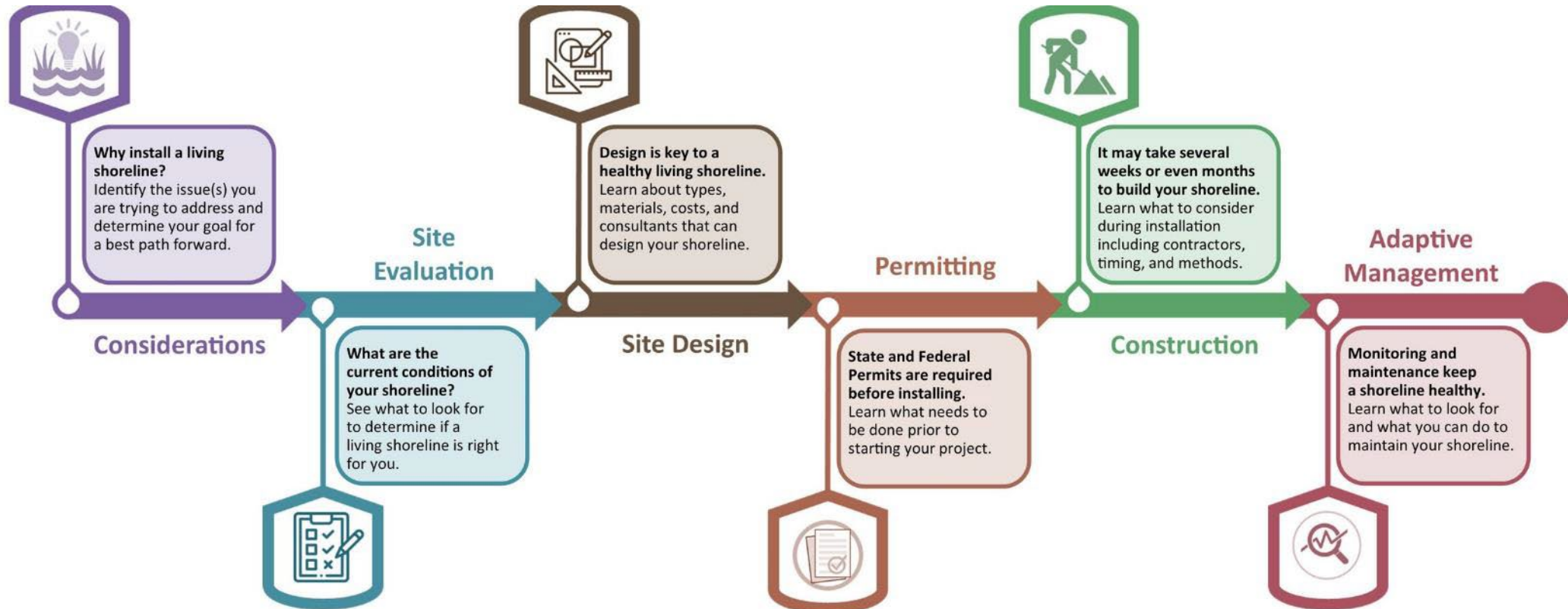


EROSION CONTROL TECHNIQUE THAT MAINTAINS COASTAL PROCESS.



PROVIDES A BUFFER FOR COMMUNITY INFRASTRUCTURE IMPACTED BY COASTAL FLOODING AND WAVE ACTION.

Where to Start?



From Concept to Design

- ✓ Identify project goals
- ✓ Develop partnerships
- ✓ Visit/view existing living shorelines
- ✓ Identify funding opportunities
- ✓ Select a contractor
- ✓ Site Assessment + Concept Design
- ✓ Community outreach
- ✓ Conduct shoreline survey
- ✓ 30% design, 60% design, 90% design
- ✓ Permitting: 90 days for projects < 35ft channelward and < 500 linear feet (Larger projects require more extensive review, +240 days)

Request technical assistance

Brocato Property Conceptual Sketch



Site Assessment

- Fetch
- Orientation
- Wave Energies
- Salinity
- Existing Substrate
- Sediment Transport
- Water Depth
- Erosion Rates
- Slope
- Elevation
- Shading
- Existing Land Use
- Upland Drainage
- Floodplain
- Other Resource Impacts
- Project Goals
- Cost
- Property Ownership



Outcome 3

Utilize natural and nature-based infrastructure to enhance resilience to climate change.

What does this fund?

- Design, construction, and adaptive management.
- Shoreline restoration or stormwater projects that address flooding and/or erosion.
- Permitting fees are NOT eligible.
- Structural solutions such as bulkheads and revetments are NOT eligible.

What are the basic requirements?

- Provide community-wide coastal protection benefits to community infrastructure/assets
- Must be nature-based
- Consider climate change data and address future conditions.

Who is eligible?

- Local Governments and Nonprofits

What type of property is eligible?

- Public, Private, Community

Maryland Department of Natural Resources
Chesapeake and Coastal

GRANTS GATEWAY

FY25 Proposal Solicitation



Maryland



For more information, visit:

<https://dnr.maryland.gov/ccs/Pages/funding/grantsgateway.aspx>

Shoreline Erosion Loan Program

Protect waterfront property and enhance wildlife habitat
utilizing nature-based living shoreline techniques.

What does this fund?

- Design and construction.
- Living shorelines that address erosion.
- Structural solutions such as bulkheads and revetments are NOT eligible.

What are the basic requirements?

- A county sponsored shore erosion control tax district or a shore erosion control lien.
- 5-20 years loan term depending on techniques implemented and associated costs.

Who is eligible?

- Counties, Local Governments
- Individuals, Groups of homeowners
- Nonprofits, Community Organizations.

Maryland Department of Natural Resources
Chesapeake and Coastal

GRANTS GATEWAY

FY25 Proposal Solicitation



For more information, visit:

<https://dnr.maryland.gov/ccs/Pages/funding/grantsgateway.aspx>



What are Living Shorelines?

Living shorelines are practices that use plants and sand, rock, oyster shell or other natural materials to protect a shoreline and to create, maintain, and enhance habitat.

Opportunities Available to Private Homeowners

Direct Funding

- MDE Linked Deposit Program
- USDA Farmable Wetlands Program (FWP)

Other Incentives

- MDNR Shoreline Erosion Loan Program
- Anne Arundel County's Marsh Grasses Program
- Anne Arundel County's Stormwater Management Property Tax Credit Program
- USDA Wetlands Reserve Easements (WRE)



Additional Funding

Maryland-Specific Funding for Private Homeowners

mde.maryland.gov/programs/water/WetlandsandWaterways/Pages/Living-Shoreline-Funding-%26-Incentives.aspx

NWF Nature-based Solutions Funding Database

fundingnaturebasedsolutions.nwf.org/

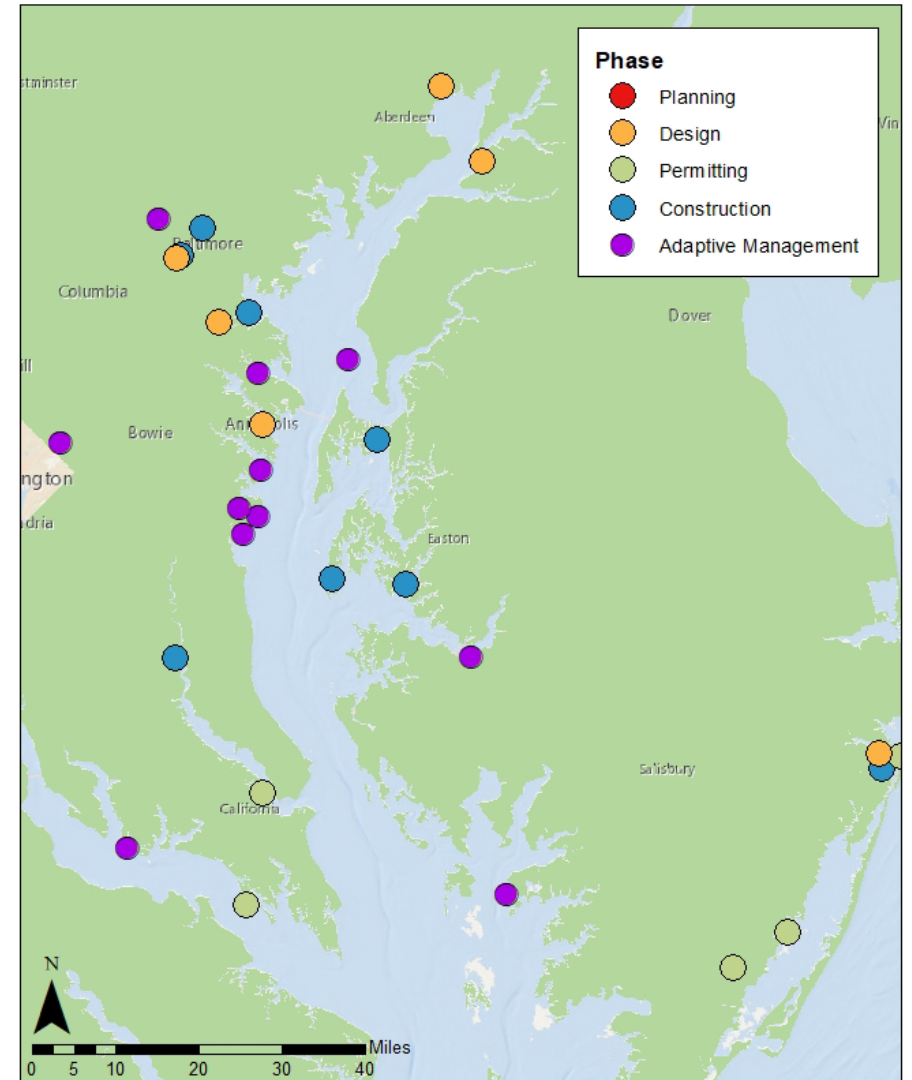
DNR Resiliency through Restoration Grants

Demonstrate how natural and nature-based features can help enhance community resilience to the impacts of climate change.

Proposals are reviewed for:

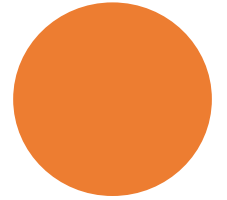
- Coastal Exposure Reduction
- Ecological Enhancement
- Cost Efficiency
- Adaptation Potential
- Local Capacity for Implementation
- Demonstration Value
- Social Benefits and Equity
- Proposal Completeness

Resiliency through Restoration
Projects by Phase



Climate Change Data

- State Sea Level Rise Report
 - Statewide: 1.7 ft by 2050
 - Updated every 5 years
- Precipitation Projections
 - NE Chapter of the 4th National Climate Assessment
 - Local precipitation trends/projections
 - Chesapeake Bay Program IDF Curves:
<https://midatlantic-idf.rcc-acis.org/>



Tools to analyze sea level rise

- Maryland Coastal Atlas
- NOAA Sea Level Rise Viewer
- SLR Projections Guidance Document

Resilient Design Techniques

- Maximize wetland vegetation and plan for marsh migration
- Select native vegetation that adapts to changes in salinity and elevation
- Balance structural and natural components
- Design open systems (embayments) with gentle slopes and strategic structures
- Incorporate sea level rise projections and high tide flood predictions into the design; consider adding to structures over time as needed
- Evaluate sites holistically to address coastal and precipitation impacts
- Consider invasive species management / adaptive management



Construction & Planting Considerations

- Permitting requirements
- Time-of-year restrictions
- Unplanned site conditions, high tides/storm impacts, erosion, or loss of materials
- Manage for geese (and people!)
- Plan for flexibility



Estabilización de Costa en Proceso

¿Te estás preguntando para qué son las rejas? Están ahí para los gansos. Las plantas costales, como las que están plantadas aquí-*Spartina patens* y *Spartina alterniflora*-, necesitan tiempo para crecer sus raíces. Las raíces de estos pastos son como el pegamento que mantiene la costa unida y previene la erosión.



Esta reja es solo temporaria.

¡Por favor use el camino designado y no mueva la reja temporal! Esta reja es la única cosa que mantiene que los gansos no se coman las plantas. Tal vez no sea bonito ahora, pero la costa preservada lo será en el futuro.

¡Tu costa te lo agradece!

Shoreline Stabilization in Progress

Wondering what these fences are for? They are for geese! Shoreline plants, like the saltmeadow hay and smooth cordgrass planted here, need time to grow their roots. The grass roots are the glue that will hold the shoreline together and stop erosion.

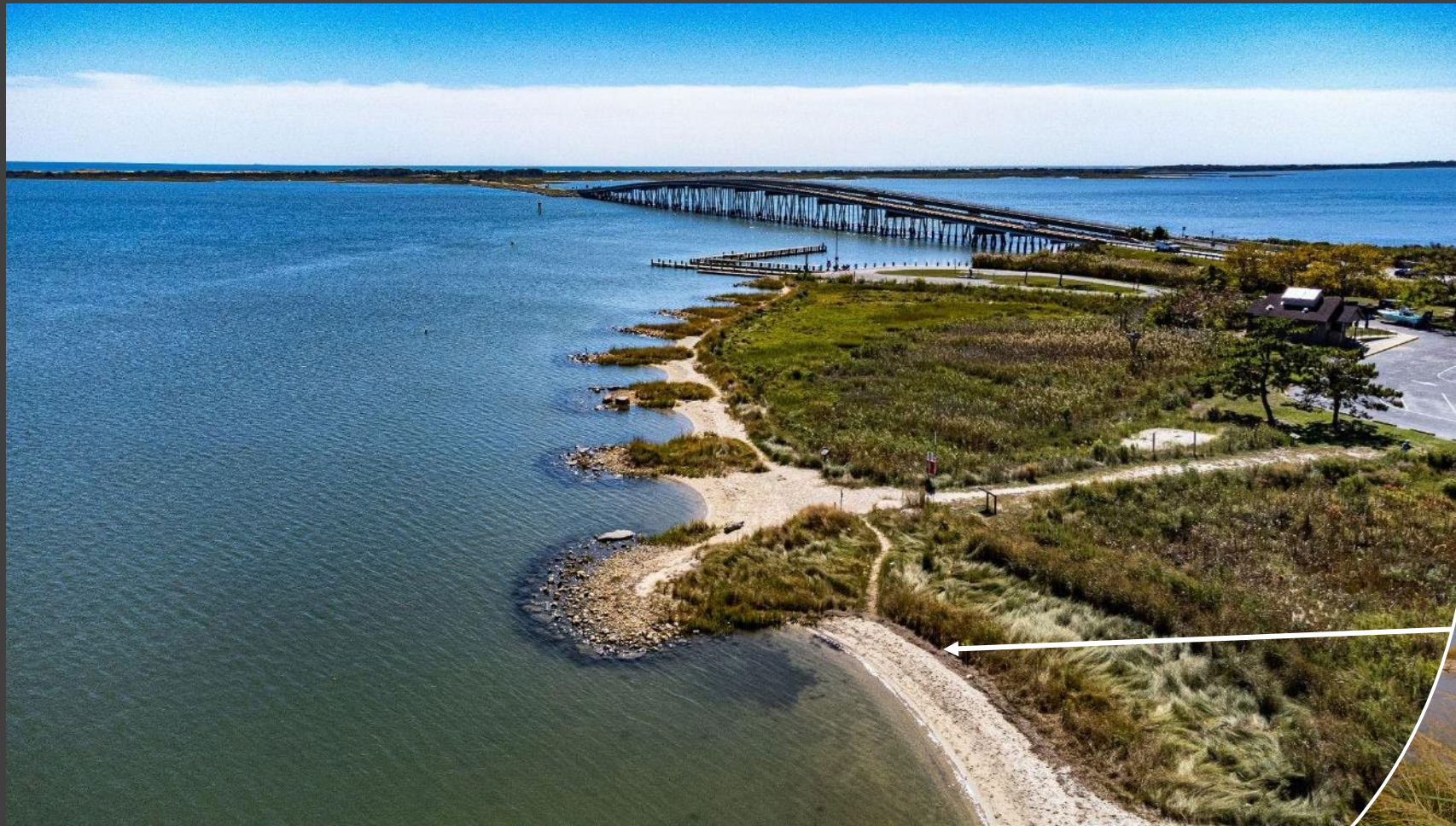


This fencing is temporary.

Please use the designated path and do **NOT** remove this **temporary** fence! It is the only thing keeping geese from feasting on the shoreline plants. It may not be pretty, but the preserved shoreline will be.

Your shoreline thanks you!





- ✓ Community Resilience
- ✓ Habitat
- ✓ Water Quantity
- ✓ Water Quality
- ✓ Public Access



**Project Spotlight:
Assateague State Park
Worcester County**

- 700 LF of living shoreline (vegetated headland breakwaters)
- 0.14 AC of non-tidal wetland enhancement



- ✓ Community Resilience
- ✓ Habitat
- ✓ Water Quantity
- ✓ Water Quality
- ✓ Public Access

**Project Spotlight:
West River Methodist Center
Anne Arundel County**

- 885 linear-foot (vegetated breakwater + cobble beach) living shoreline
- 430 linear-foot Regenerative Stormwater Conveyance (RSC) Wetland
- Bulkhead replacement



- ✓ Community Resilience
- ✓ Habitat
- ✓ Water Quantity
- ✓ Water Quality
- ✓ Connection to Planning

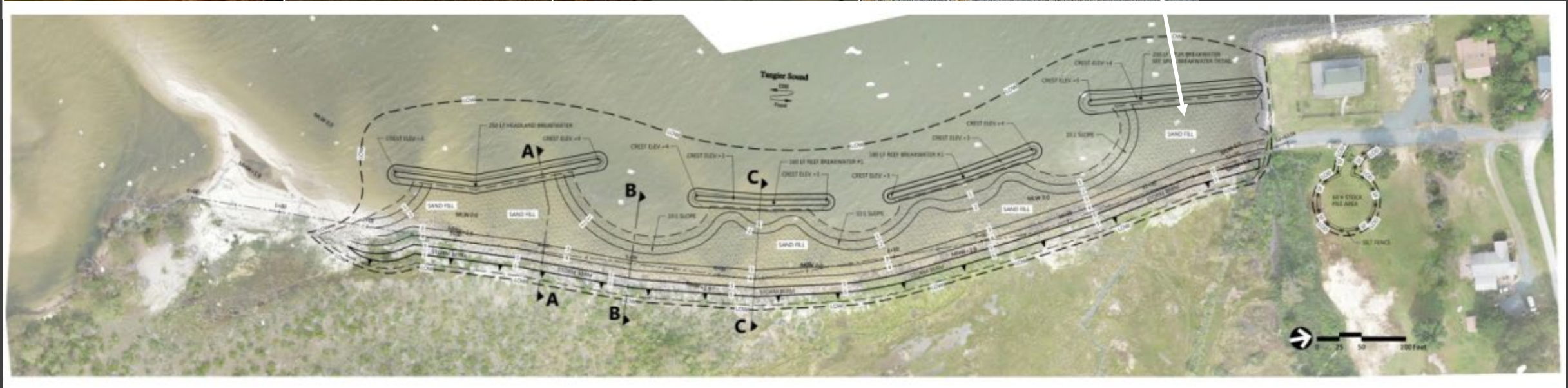


Project Spotlight:
Tilghman on the Chesapeake
Talbot County

- ~975 linear-foot living (vented marsh sill, concrete oyster break, marsh migration corridor, sand dune)
- Upland stormwater features (meadow, non-tidal wetland)



- ✓ Community Resilience
- ✓ Water Quantity
- ✓ Habitat
- ✓ Connection to Planning



Project Spotlight:
Deal Island
Somerset County

- 1,100 linear-foot (headland breakwater) living shoreline
- Dunes with high marsh and dune grass plantings
- Reef breakwaters with pocket beaches



May 2019



June 2022



September 2022



August 2023



Living Shoreline Establishment

Adaptive Management


Monitoring and adjusting a restoration practice in the face of changing and dynamic conditions.

Keep an eye out for:

- Changes to vegetation coverage
- Erosion that worsens over time
- Invasive species establishment
- Seasonal changes vs. storm impacts



CONTACT



Nicole Carlozo
Center for Coastal Planning
Resiliency through Restoration Grant
nicole.carlozo@maryland.gov
410-260-8726



Wesley Gould
Shoreline Conservation Service
Shoreline Erosion Control Loan
wesley.gould@maryland.gov
410-260-8812

