

MARYLAND'S LIVING SHORELINES PROGRAM

Bhaskaran Subramanian
Groton, CT
June 24, 2015



- Erosion & traditional approaches
- Living shorelines- what is it?
- Maryland's Living Shorelines program
 - LS Law
 - Products
 - Funding- loans, grants, etc
- How are projects in MD performing?
Lessons learned.
- Strengths of the Program
- Stumbling blocks
- Moving forward



Erosion is a natural phenomenon



Rip-rap or Revetment

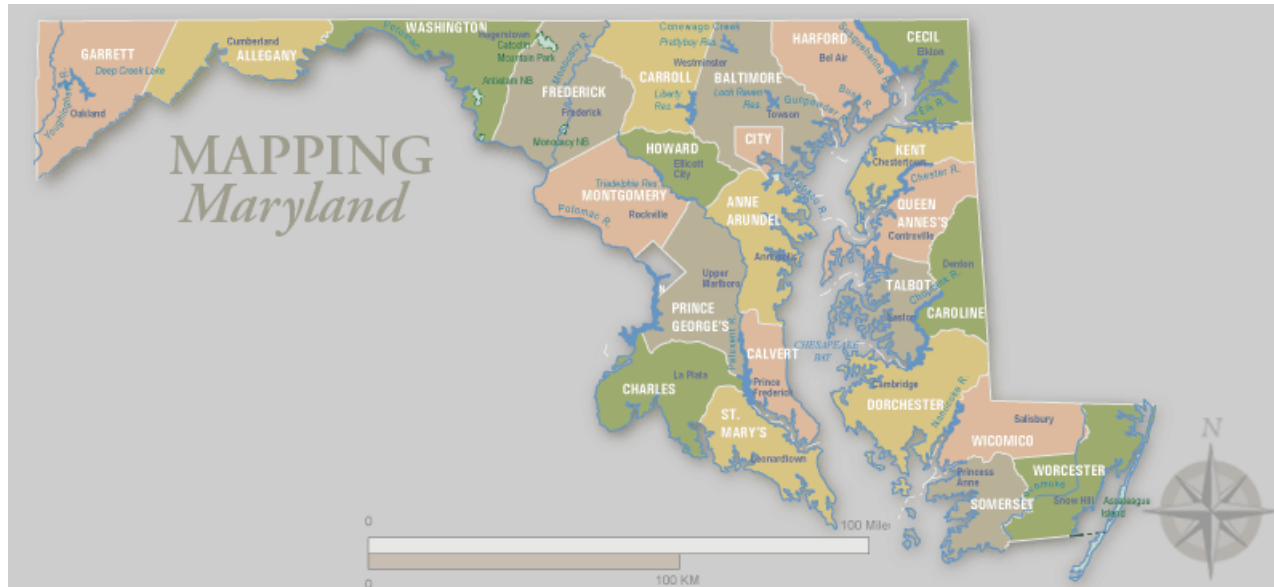
Wooden Bulkhead



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Recognizing the Problem

- MD shorelines approximately 7,000 miles.



- Erosion affects all 16 coastal counties along the Chesapeake Bay and Coastal Bays watersheds.

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Excessive ??



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



Low Erosion: 2-4 ft/y

Slight Erosion: 0-2 ft/y





High Erosion: 8+ ft/y

Moderate Erosion: 4-8 ft/y



LIVING SHORELINES



Our Definition....

- “..... a suite of techniques which can be used to **minimize** coastal erosion and **maintain** coastal process”.
- Techniques may include the use of fibre coir logs, sills, groins, breakwaters or other natural components used in combination with sand, other natural materials and/or marsh plantings.
- These techniques are used to **protect, restore, enhance** or **create** natural shoreline habitat.



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“Biological” Advantages of Living Shorelines



- Provides shallow water habitat that results in higher abundance and diversity of aquatic species both nearshore and offshore.



- Helps to maintain a link between aquatic and upland habitats, providing shoreline access for wildlife and recreation.



- Maintains natural aesthetic.

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“Physical” Advantages of Living Shorelines



- Improve water quality by settling sediments and filtering pollution.



- Absorb wave energy.



- Maintain natural shoreline dynamics and sand movement.



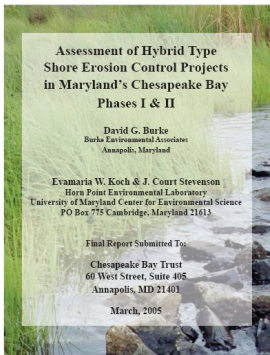
- Costs comparable to “structural” options.



- Not effective in all situations.

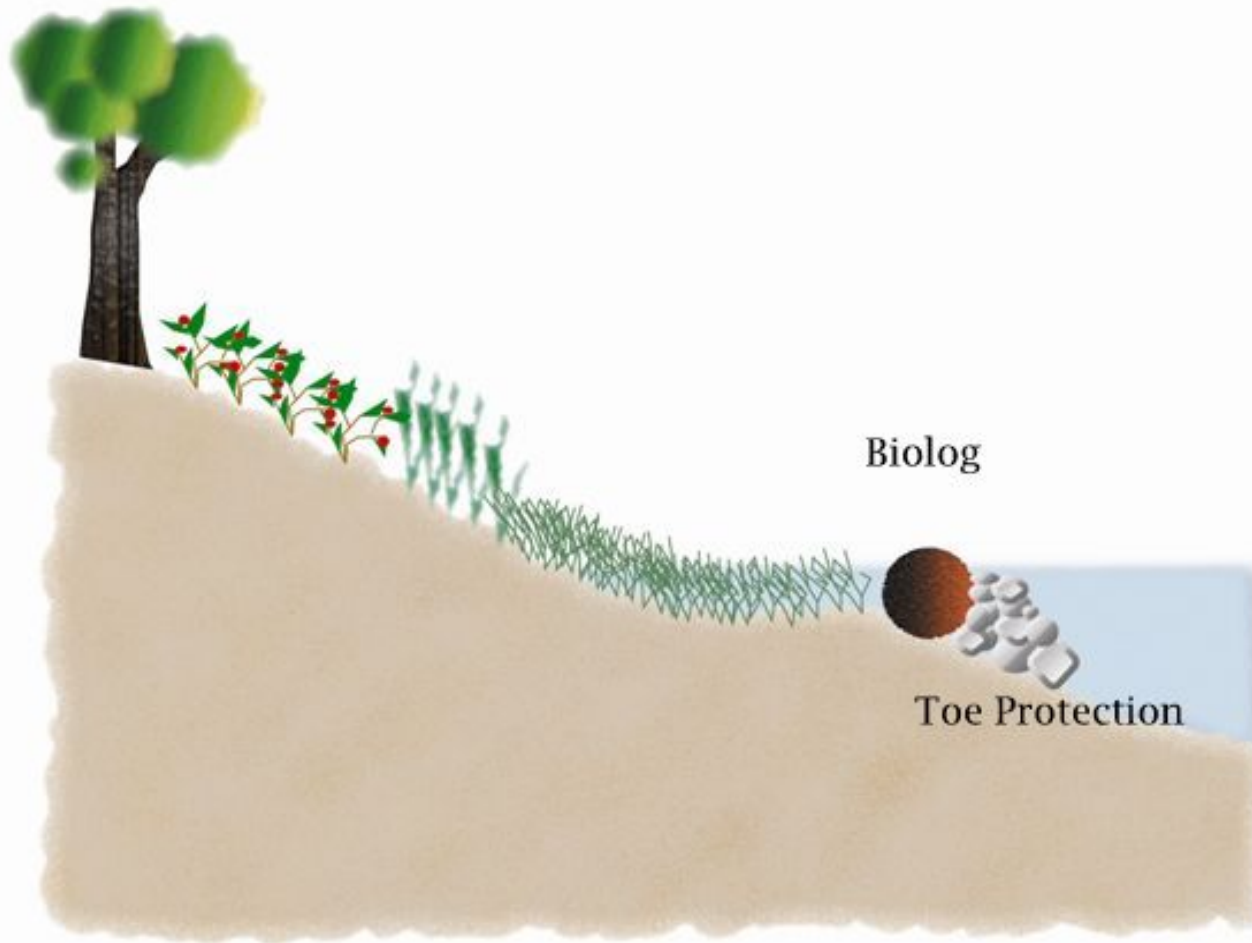


- Limited number of marine contractors with knowledge/expertise in living shorelines.



- Limited detailed science/literature.

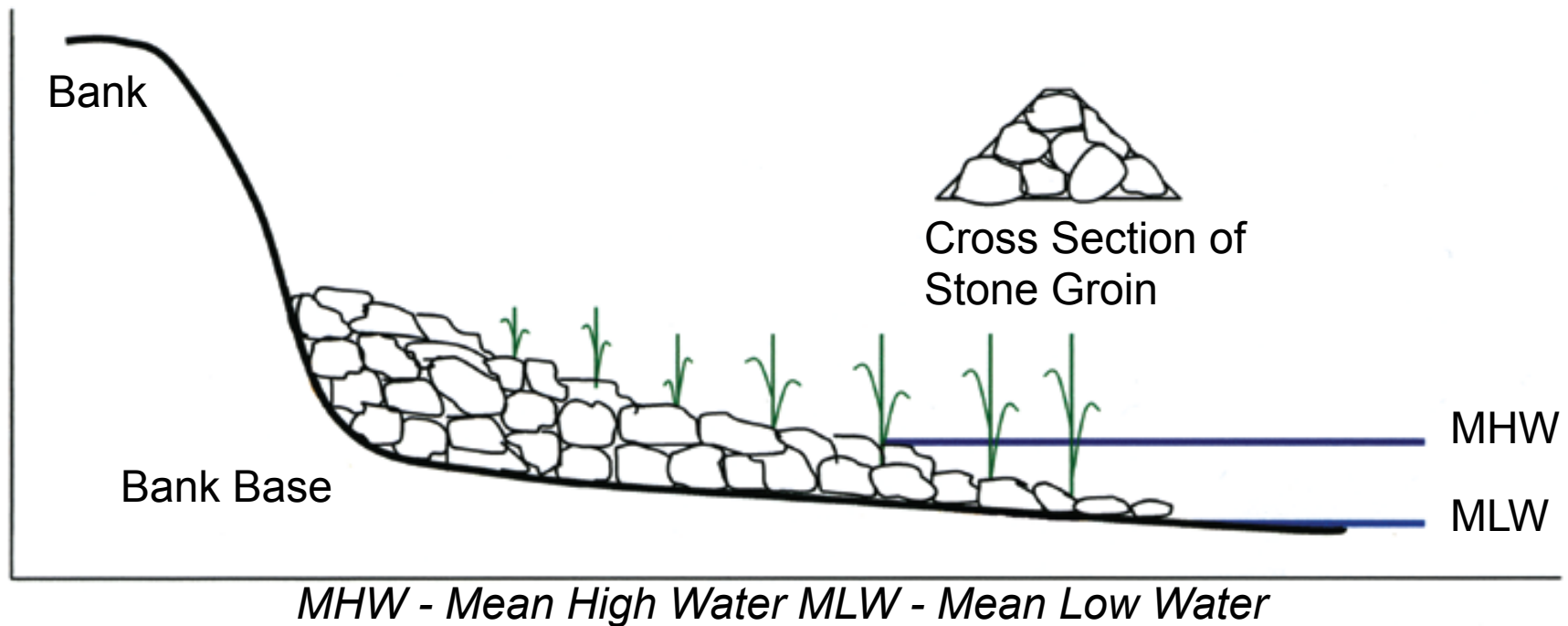
Biolog Based Designs



Biolog Projects



Cross-Section of a Typical Groin



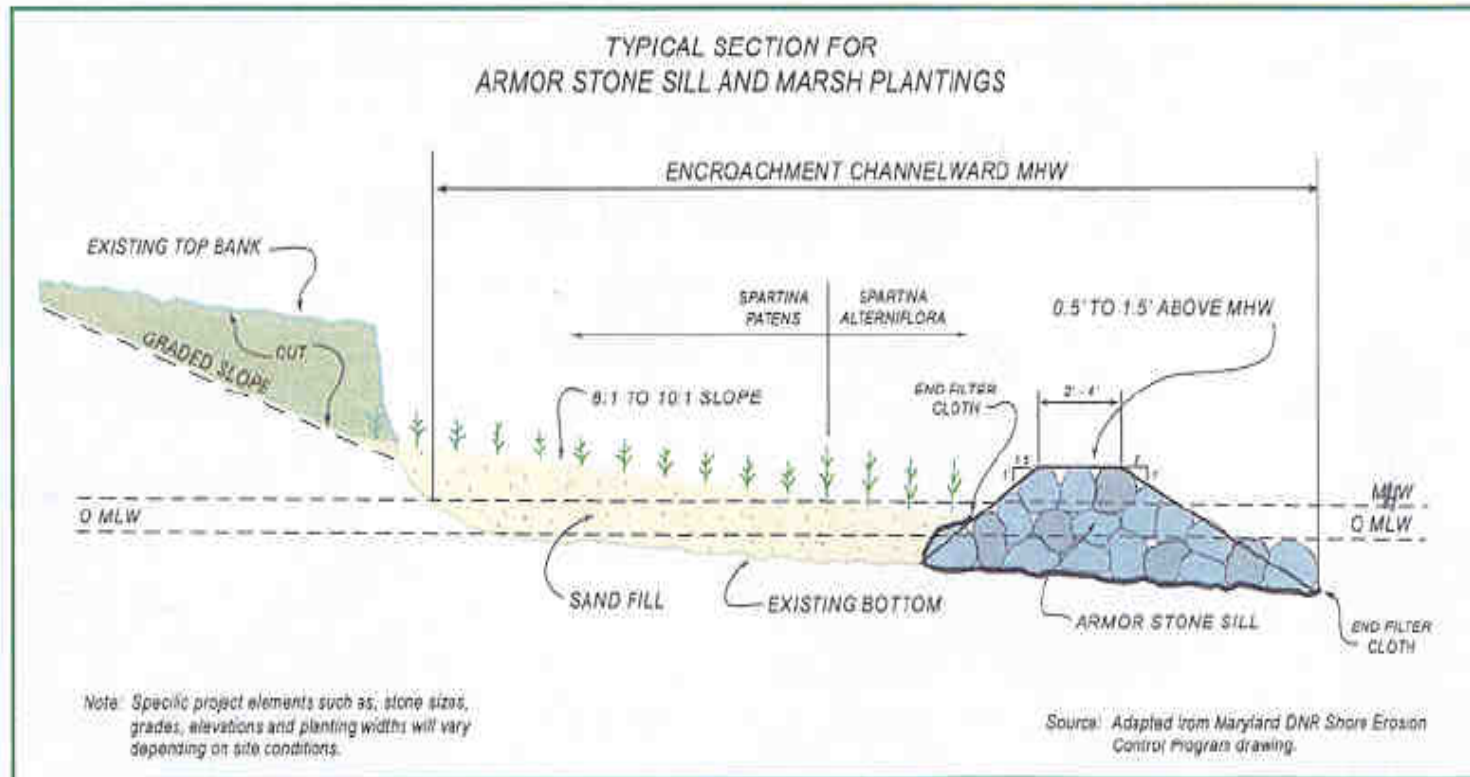
Profile of typical stone groin and cross section used to stabilize eroding banks.

Note: Plants are placed between groins on the sand fill.

Groins



Sill Design



S. alterniflora is planted from mid-tide to mean high water

S. patens is planted above mean high water

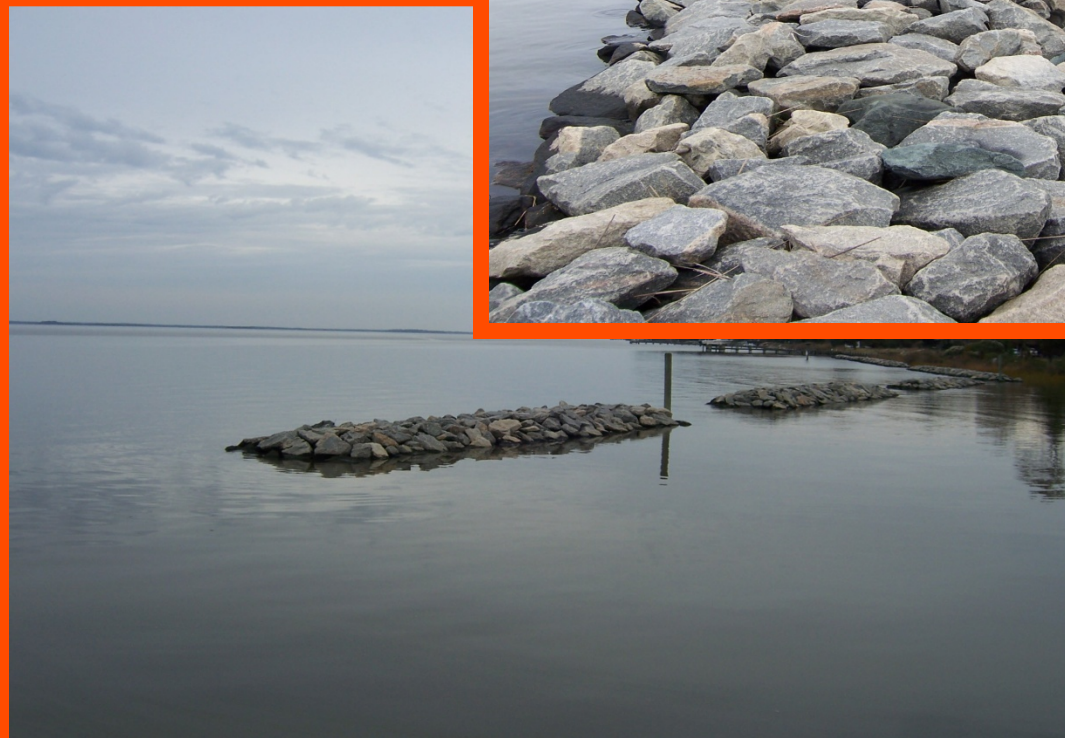
Sills with Marsh Plantings



Sills with Marsh Plantings



Breakwaters



Living Shorelines Protection Act of 2008

- Bill passed into Law October 2008; regulations implemented in February 2013.
- Previously, Living Shorelines were “recommended” but not required.
- The law provides the regulatory agency with a strong foundation to promote alternate shoreline erosion control measures.
- The Law clearly states: “Improvements to protect a person’s property against erosion shall consist of non-structural shoreline stabilization measures (i.e. living shorelines) except where the person can demonstrate such measures are not feasible, or where mapping indicates areas that have been deemed appropriate for structural shoreline stabilization measures”.



Prior to Feb. 4, 2013

- Erosion control measures considered in order of preference
 - No action
 - Nonstructural shoreline stabilization
 - Structural measures to stabilize nonstructural stabilization
 - Revetments
 - Breakwaters
 - Groins
 - Bulkheads
- COMAR 26.24.04.01



Post- Feb. 4, 2013

- Regulations implemented February 4, 2013
- Order of preference
 - No action
 - Relocation of structures
 - Nonstructural shore erosion control project
 - Structural shore erosion control project with MDE approved
- Waiver



LS Waiver Request Form



Living Shoreline Waiver Request Maryland Department of the Environment Water Management Administration



The Living Shoreline Protection Act of 2008 requires that improvements to protect a person's property against shoreline erosion consist of marsh creation or other nonstructural shoreline stabilization measures (i.e. Living Shorelines) that preserve the natural environment unless:

A) The project shoreline is mapped by the Maryland Department of the Environment (MDE) as an area appropriate for structural shoreline stabilization measures, or

B) The applicant can demonstrate to MDE's satisfaction that nonstructural measures are not feasible due to excessive erosion, severe high energy conditions, or the fact that the waterway is too narrow for effective use of nonstructural shoreline stabilization measures.

A person meeting any of these conditions should provide the information requested below, which will help to demonstrate that nonstructural shoreline stabilization measures are not feasible for the project site and provide the basis for the issuance of a waiver by MDE exempting the property owner from the requirement to construct a living shoreline.

1. Name of Property Owner: _____
2. Address of Property Owner: _____

3. Address of Project Site: _____

4. Previous MDE permit number (if known): _____

Please refer to the Living Shoreline Waiver Diagram on Page 3 and the Living Shoreline Waiver Flowchart on Page 4 when you answer the questions in the following table.

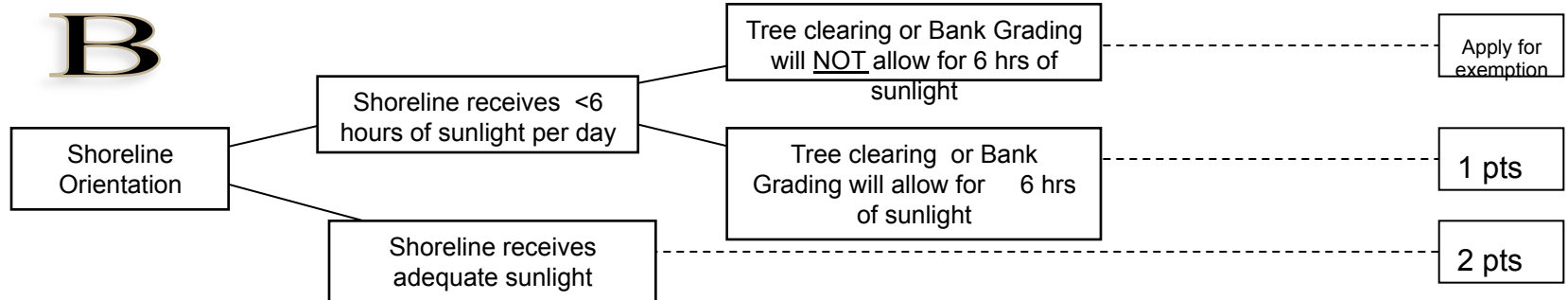
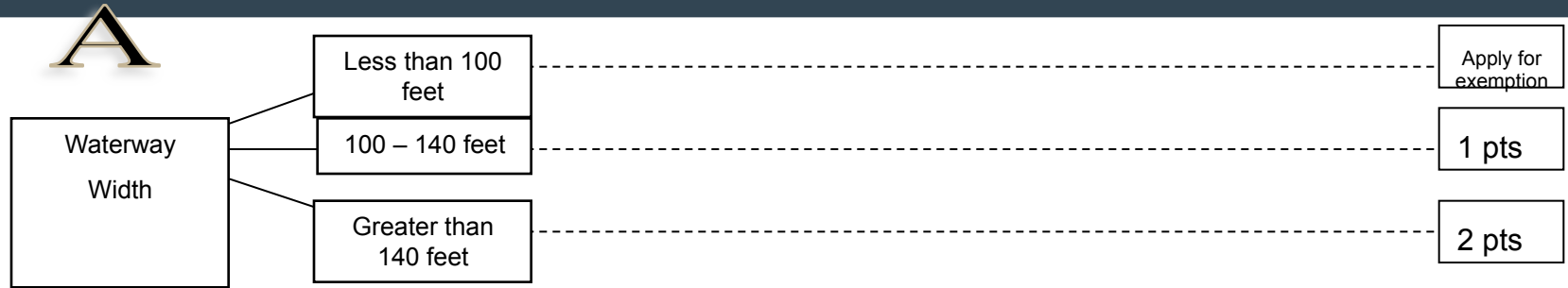
NUMBER	CATEGORY	QUESTION	ANSWER
1	Navigation	Distance in feet from the Mean High Water Line to the edge of the closest mapped or unmapped navigable channel.	
2	Width of Waterway	Distance in feet from edge of worksite shoreline perpendicular across the waterway to the opposite shoreline.	
3	Depth at Toe of Bank	Depth of the water in feet from the Mean Low Water Line to the bottom or toe of the shoreline bank.	

Water Management Administration
Page 2 of 2

NUMBER	CATEGORY	QUESTION	ANSWER	
4	Depth of Waterway	Depth of water in feet relative to the Mean Low Water Line at the channelward extent of the proposed nonstructural shoreline erosion control measure.		
5	Fetch	Distance in feet from the edge of the worksite shoreline across the closest waterway in the direction of prevailing summer/winter winds to the opposite shoreline.		
6	Bank Orientation	Provide a compass direction perpendicular to the line of the worksite shoreline. Direction can be given as NE, SW, etc. or as a compass heading (i.e., 45°, 225°).		
7	Bottom Substrate	Firmness of bottom material or substrate?	Hard	Soft
		Describe the composition of the bottom material or substrate (i.e., sand, mud, silt, clay, gravel)? <i>Explain:</i> _____ _____		
8	Sensitive Species	Will project construction adversely impact fish, plant, or wildlife habitat? If unknown, leave this section blank. MDE will coordinate with the Maryland Department of Natural Resources to determine if there are any potential impacts to sensitive species.	Yes	No
		How will a structural shore erosion control project minimize impacts to fish, plant and wildlife habitat? <i>Explain:</i> _____ _____		
9	Site Access	Is access to the work site via <u>water</u> impractical?	Yes	No
		How will the worksite be accessed to facilitate construction of the project? <i>Explain:</i> _____ _____		

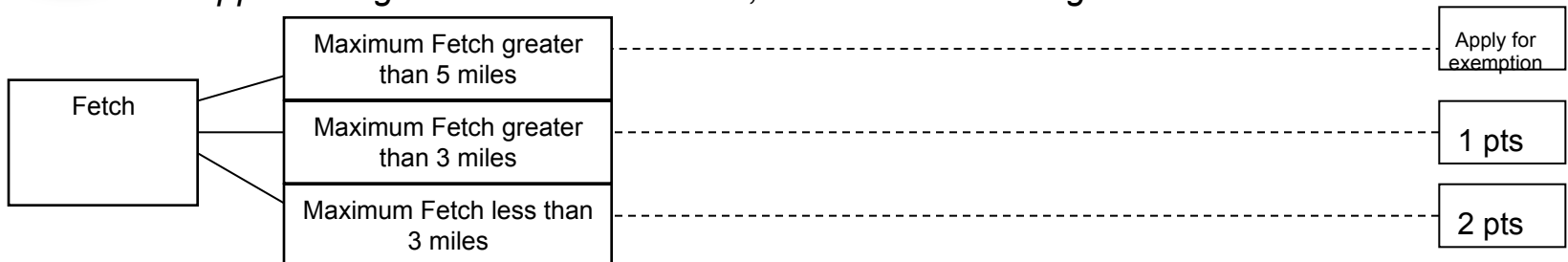
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MDE LIVING SHORELINE WAIVER – Worksheet (Page 1)



C

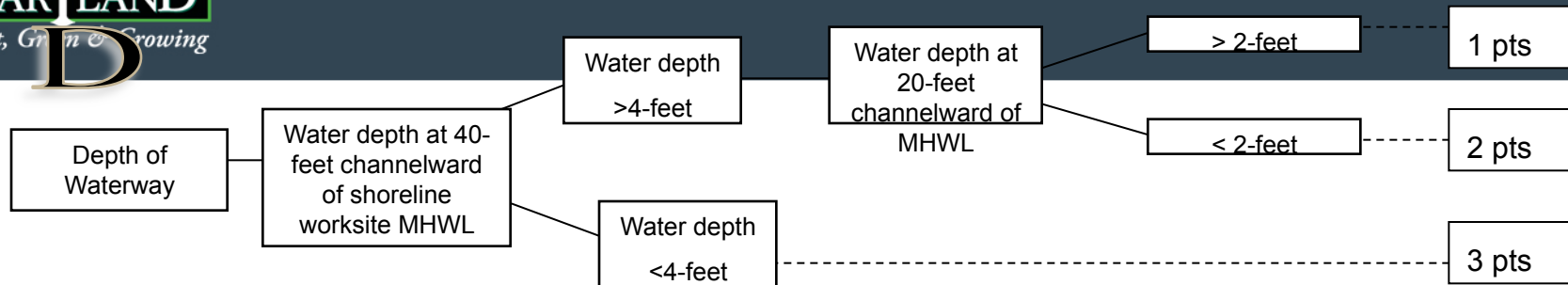
Fetch: Maximum distance wind may travel unimpeded over open water before approaching the worksite shoreline; relates to wave height



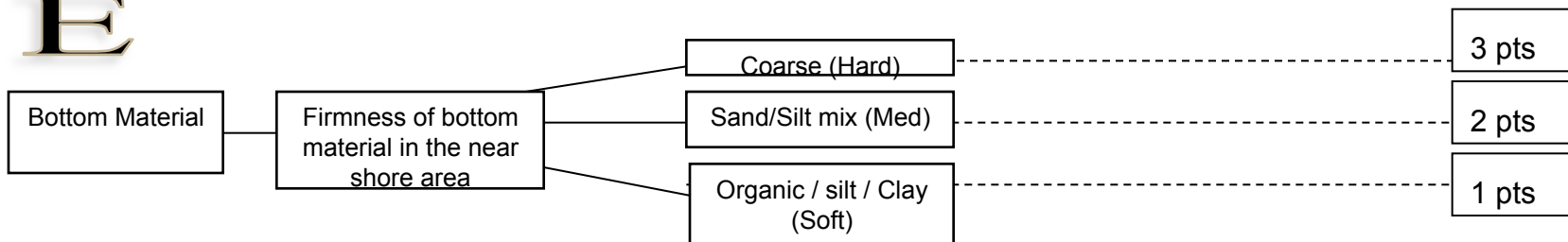


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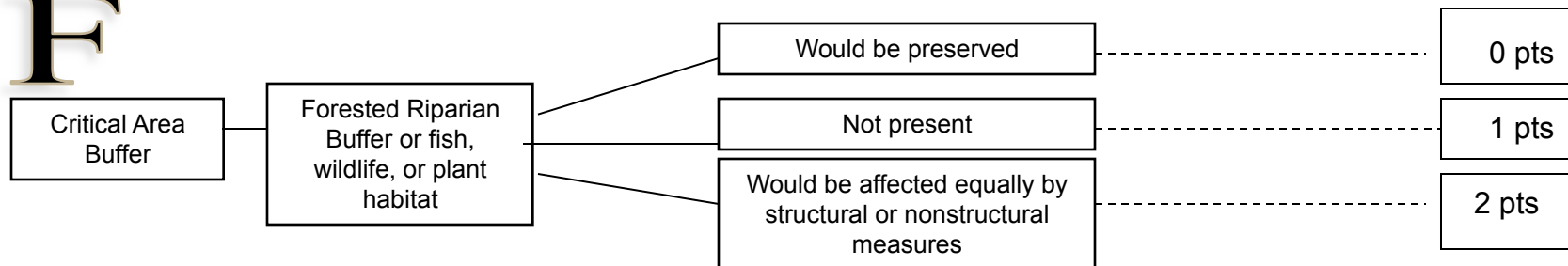
MDE LIVING SHORELINE WAIVER – Worksheet (Page 2)



E



F

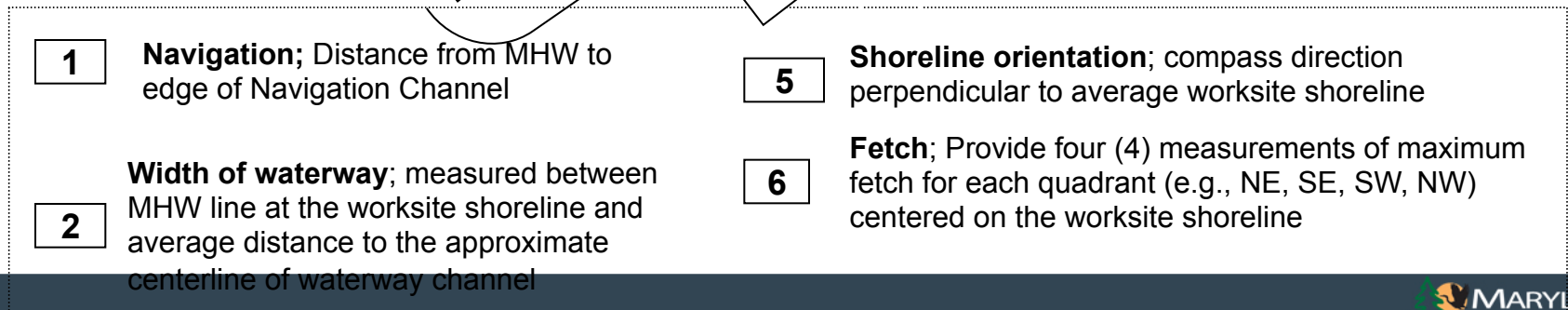


2 to 5
Apply for exemption

6 to 8
Contact **MDE** for evaluation

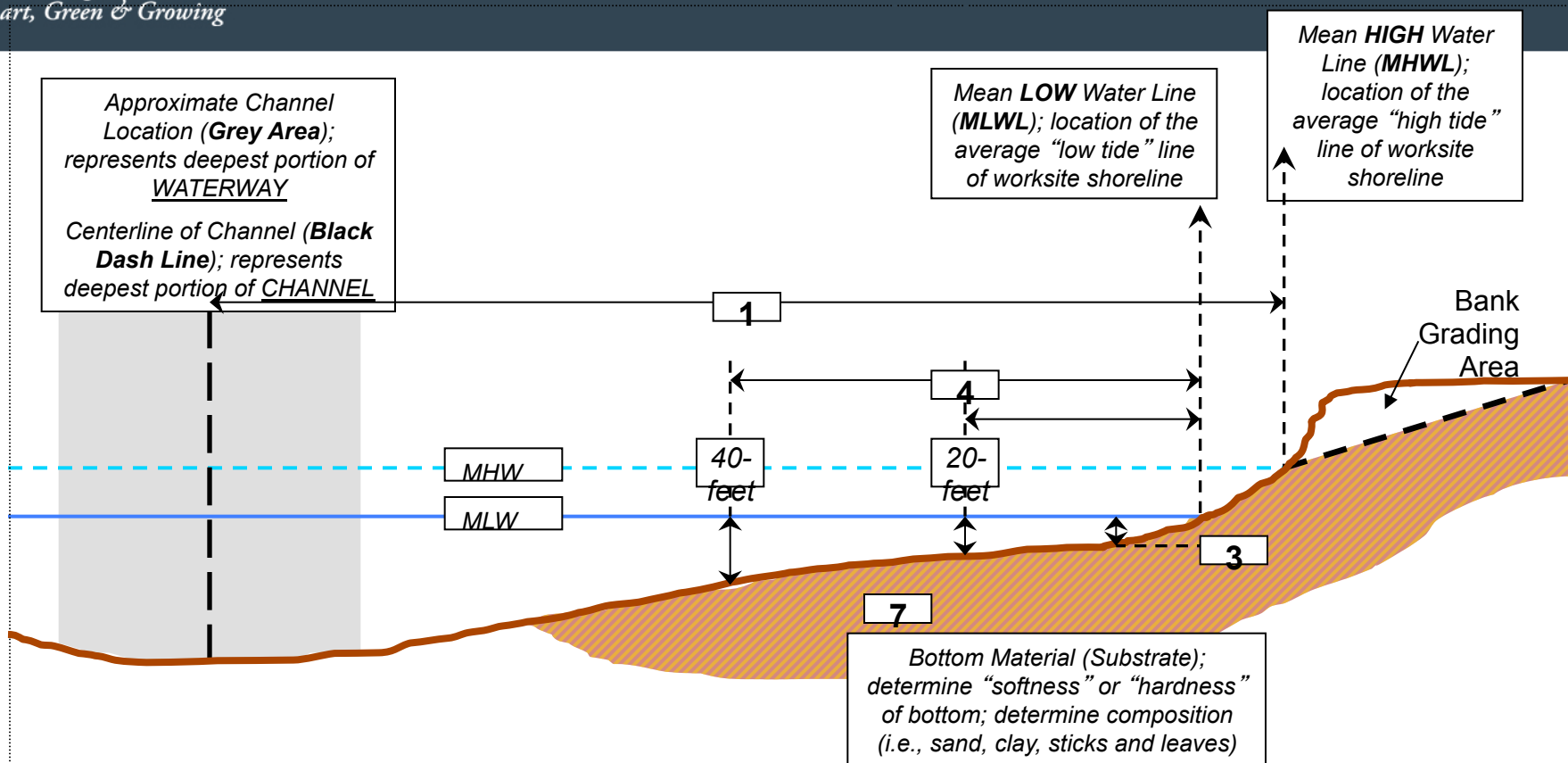
9 to 13
Living Shoreline is recommended

TOTAL



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MDE LIVING SHORELINE WAIVER – EXHIBIT A (CROSS SECTION)



MHW Mean High Water

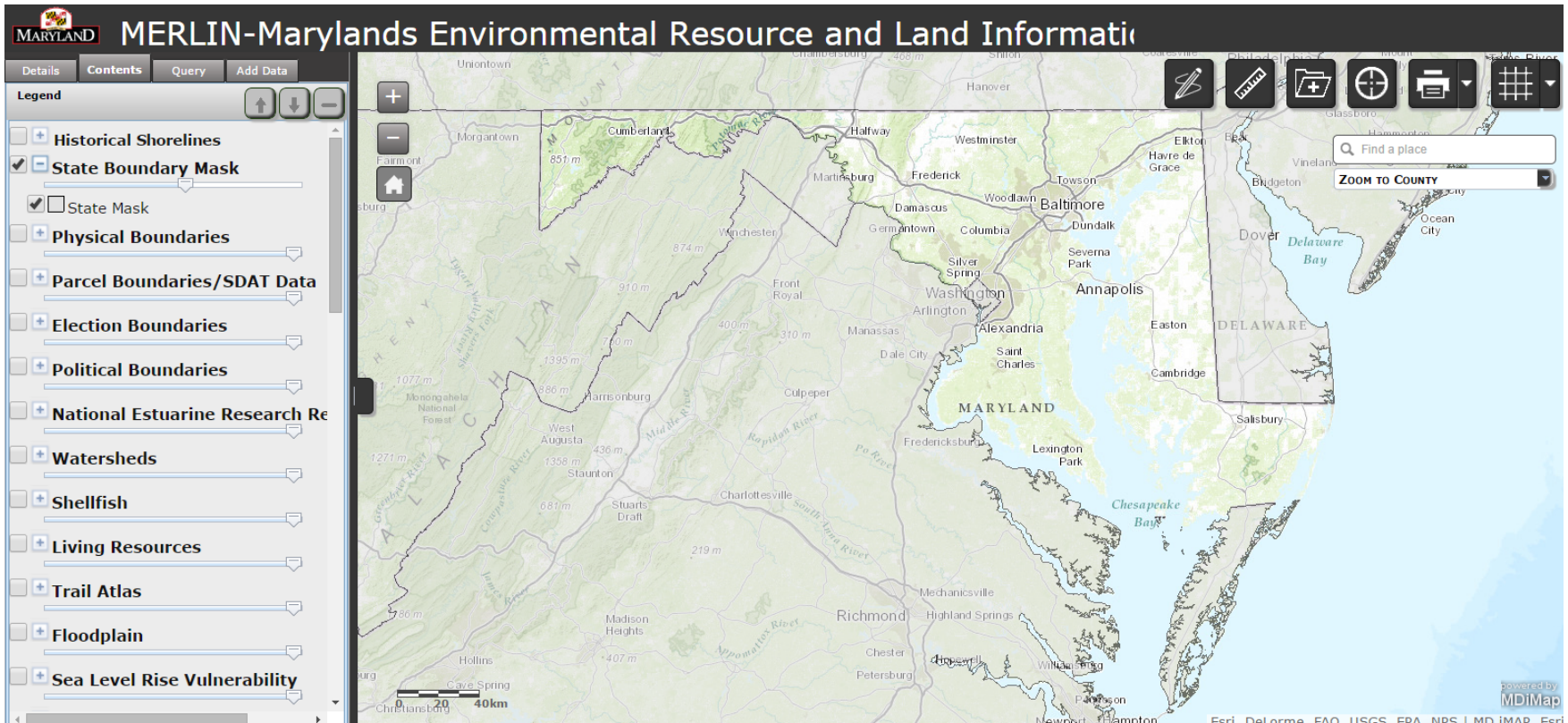
MLW Mean Low Water; referenced to 0.0 ft.

3 Depth of Water at toe or bottom of bank

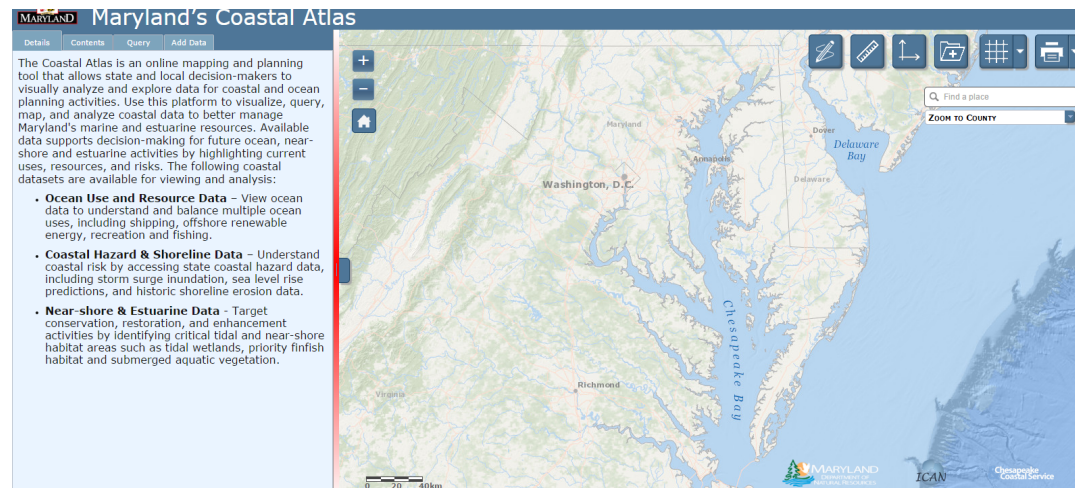
4 Measure water depth during low tide at approximately 20-feet channelward of the MLWL and at approximately 40-feet channelward of the MLWL



- Maryland's Environmental Resources & Land Information Network
- <http://www.mdmerlin.net/index.html>



- Online mapping and planning tool
- Partners: DNR, MES, Univ. of MD, TNC and NOAA
- Visualize, query, map, and analyze available data to better manage our marine and estuarine resources.



<http://dnr.maryland.gov/ccs/coastalatlas>

Historic Erosion Rate



Project Criteria

Project Selection Criteria DNR-SCMS

Creek, Cove	>	Minor River	>	Major Tributary	>	Bay
Water Depth	-1.0 ft	-1.0 to -2.0		-2.0 to -4.0		-4.0 to -15.0
Fetch	0.5 mile	1.0 to 1.5 mile		2.0 or more		2.0 or more
Erosion	2 ft/yr or less	2 to 4 ft/yr		4 to 8 ft/yr		8 to 20 ft/yr
Low wave energy	>	Medium wave energy	>	High wave energy		
Non-Structural	>	Hybrid	>	Structural		
Type I		Type II		Type IV		
Beach replenishment		Marsh fringe w/stone groins		Bulkheads		
Fringe marsh creation		Marsh fringe with stone sills		Revetments		
Marshy islands		Marsh fringe with stone breakwaters		Stone reinforcing		
Coir logs edging and groins		Marsh edging with stone		Pre-cast concrete units		
		Stabilization of streambanks with vegetation and stone				
		Type III				
		Stone breakwaters with beach replenishment and appropriate vegetation				
Least expensive	>	Medium priced	>	High priced	>	Expensive
\$100 - \$200/L.F.		\$250 - \$400/L.F.		\$450 - \$600/L.F.		\$500 - \$1,500/L.F.

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Evolution of Living Shorelines

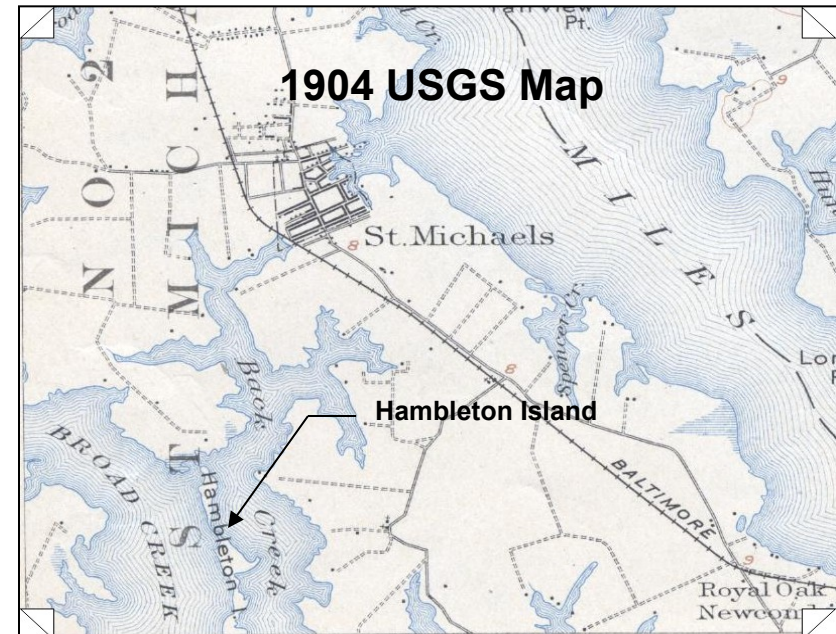
Edgar W. Garbisch

- 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.



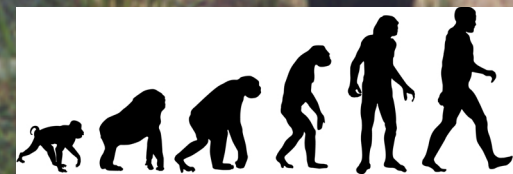
"His work is interesting, but I don't want to see him running around the country like Johnny Spartinaseed."

- John Clark (Conservation Foundation)



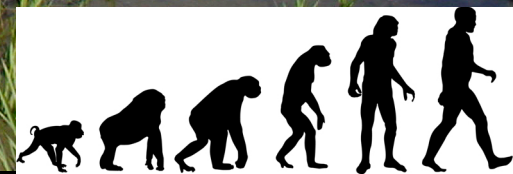
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Evolution of Living Shorelines



Evolution of Living Shorelines

Low-profile gapped sills



Windy Hill Farm Project



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What Have We Learned Over the Last 37 Years?

- #1: Appropriate techniques in appropriate locations.
- No one technique works for all sites.
 - Each site has its own peculiarities and each design should be developed individually.



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What Have We Learned Over the Last 37 Years?

#2: Balancing “habitat” with “shoreline protection”.





OUTREACH & EDUCATION



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Outreach Materials



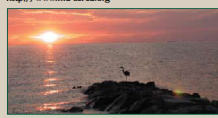
CONTACT INFORMATION

Calvert County Department of Planning and Zoning
County Services Plaza, 150 Main Street
Prince Frederick, MD 20678
Phone: (410) 535-1600, ext. 2356/(301) 855-1243
<http://www.co.cal.md.us/business/planning>

Calvert Soil Conservation District
65 Duke Street, Room 106
P.O. Box 657
Prince Frederick, Maryland 20678
Phone: (410) 535-1521 ext.3
<http://calvertsoil.org>

Southern Maryland RC&D Board, Inc.
303 Post Office Road, Suite B4A
Waldorf, Maryland 20602
Phone: (301) 932-4638/(301) 870-7158
<http://www.somdrcd.org>

Eastern Shore Resource Conservation & Development Council Inc.
8133 Elliot Road, Suite 201
Easton MD 21601
410-822-9300
<http://www.md-esrcd.org>

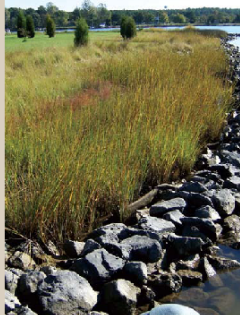


Photos courtesy of Calvert County Planning and Zoning and Eastern Shore RC&D Council.

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LIVING SHORELINES IN CALVERT COUNTY



A GUIDE FOR PROJECT SELECTION

SHORELINE POLICIES AND CRITICAL AREA LAWS

The Somerset County Critical Area Program is designed to minimize adverse impacts on water quality that result from pollution; establish land use policies for development; and conserve fish, wildlife, plant habitats in the Chesapeake Bay Critical Area.

The Somerset County Chesapeake Bay Critical Area ordinances encourage the use of "soft" techniques to control erosion and improve shoreline habitat where applicable. Two new laws were passed in 2008: the Living Shorelines Protection Act and the Revised Critical Area Laws.

SUMMARY OF THE NEW LAWS

- 100-foot Buffer is expanded to 200 feet for new subdivisions in the RCA that remain RCA and applies to projects requiring site plan approval and involves a change in land use in the RCA.
- The 200-foot Buffer does not apply to residential development on existing lots.
- Shore erosion control projects are now considered a type of "home improvement."
- Licensed home improvement contractors, marine contractors, builders, tree experts, landscaping firms, and others can lose their licenses for Critical Area violations.
- Living shorelines will be the preferred method to induce erosion effective from October 1, 2008, except in areas where it can be demonstrated that these measures are not feasible.
- In making the feasibility determination, MDE will consider areas of excessive erosion, areas subject to heavy tides, and areas too narrow for effective use of nonstructural measures.
- A shore process will be part of the regulatory structure.

CONTACT INFORMATION

Somerset County Department of Planning & Zoning
11916 Somerset Avenue
Room 211 (2nd floor)
Princess Anne, MD 21853
410-651-1424
<http://www.somersetbaywatch.org/default.html>

Somerset County Soil Conservation District
30730 Park Drive
Princess Anne, MD 21853
410-651-0370

Eastern Shore Resource Conservation & Development Council Inc.
8133 Elliot Road, Suite 201
Easton MD 21601
410-822-9300
<http://www.md-esrcd.org>

Shore Erosion: The Natural Approach
<http://www.md-esrcd.org/storage/Brochure/TheNaturalApproach0907.pdf>



Photos courtesy of Maryland Coastal Bays Program and Eastern Shore RC&D Council.

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Living Shorelines in Somerset County AN INTRODUCTION

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Calvert County Department of Planning and Zoning
County Services Plaza, 150 Main Street
Prince Frederick, Maryland 20678
Phone: (410) 535-1600, ext. 2356/(301) 855-1243
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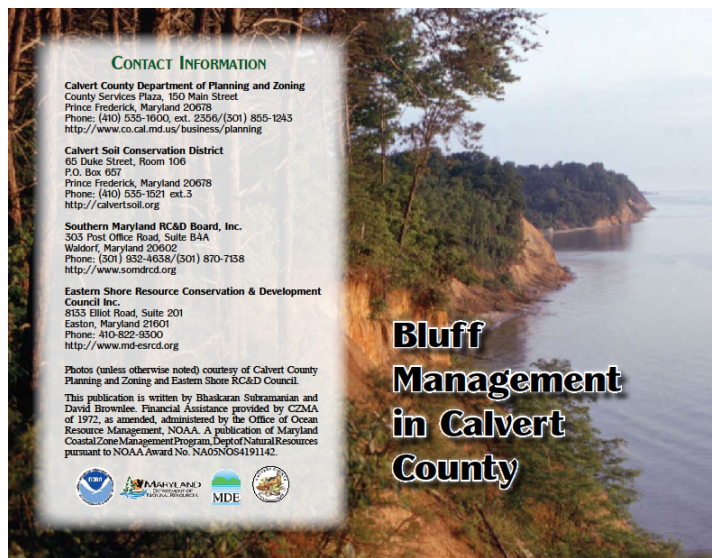
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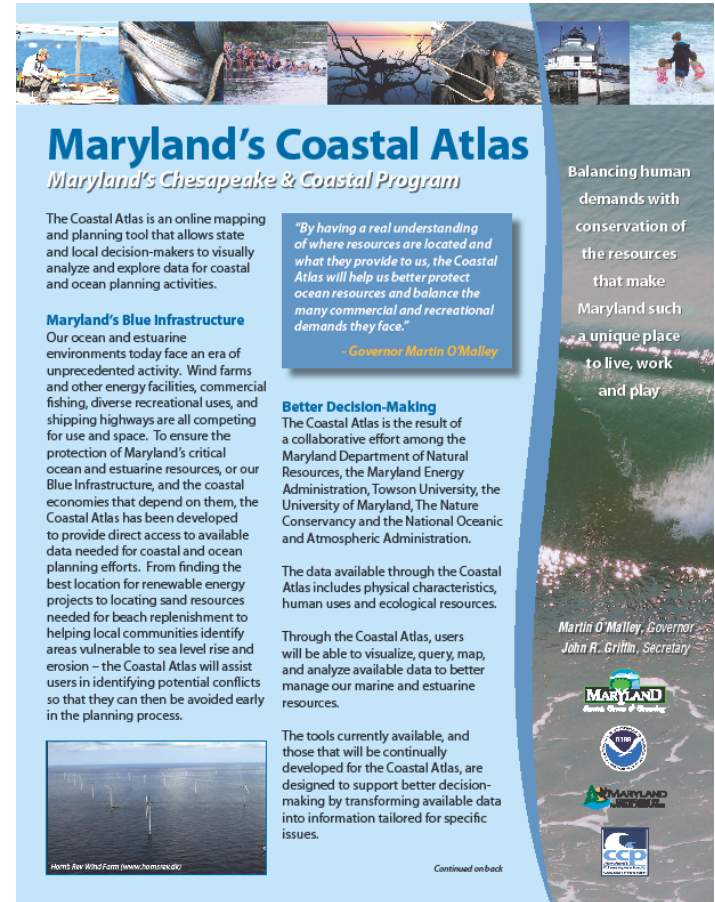
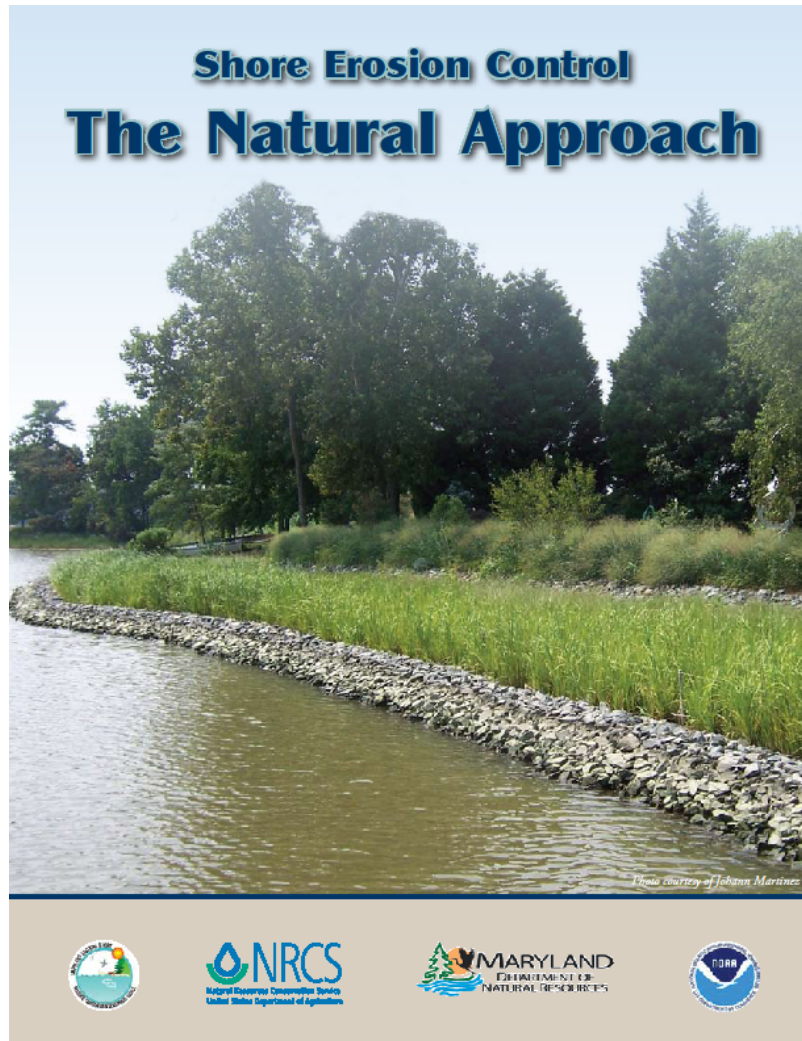
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Bluff Management in Calvert County





Factsheets

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Interpretive Panels

Living Shorelines, Naturally



Who can resist the lure of the water? Shorefronts draw us—as launchers for our work or play on river or bay, as quiet zones of beauty and tranquility.

This intertidal fringe between the high-water and low-water lines is also a fragile place, increasingly degraded by an array of intrusions: construction and development, shoreline "hardening" with seawalls and other structures, boat wakes, storms, and rising sea level. The result? Shoreline deterioration spurred by hurricanes and by the slow, steady assaults of human intervention.

Using shorelines, however, offer effective techniques for protecting and managing waterfront exposed to wave energy in the low to medium range—especially if their design addresses the specific problems of each piece of shore.

How do they work? Living shorelines control erosion by protecting, restoring, or enhancing existing habitat without disrupting natural functions of a shoreline ecosystem, such as sediment trapping and nutrient reduction. Treatments may use stones or sand fill to create low profile sills or breakwaters that slow wave energy—and plantings of marsh flora, shrubs, or trees to hold the land in place. Whatever the design, a living shoreline recreates coastal systems, benefiting wildlife and improving water quality.

It takes a community to manage erosion of our shorelines. All of us who share these resources also share responsibility for its stewardship, particularly in the face of rapid change.



First Person



"We're trying to demonstrate how you can achieve these goals—and not build the Great Wall of China."



Kevin Smith

Chief of Ecosystem and Wetland Restoration,
Maryland Department of Natural Resources

"THE LIVING SHORELINE PROJECT they had these three goals: instead of putting a lot of rock out there to create a wall, filling behind it with sand and then planting with marsh grass. We designed a project that reduced the amount of stone. We utilized living, so you have grass along the shoreline to hold in our sand fill, and plants come back just on the outside for protection. Then we brought that back as a proof-of-concept, creating a planting challenge for downstream tidal systems."

In the lower area, we put in quickstart, pocket sand, some more things like that. And then in the shell house, we put in shell rock, sand, grass, limestone, and some outside. There will eventually fill in the same. At the very top, we put in marsh grass, which is a really good sediment-trapping grass. The shell houses are a pole and a concrete, the same concept is to be planted, so it's a lot of things, which helps hold the shoreline together. It's all about creating a platform to get plants to take hold—because they do all the work after that. Once they take hold, then they're really doing the work."



"All the other projects have been done all, what on the shore this project—this one's a living and sand fill and a little bit of rock."



Dave Wilson

Coordination, Resource
Conservation and Development

"THE CHALLENGE IN THIS DESIGN AND THE LOW TIDE OF BEACH. The shoreline just isn't going to be 7 to 8 feet wide. When you're doing shore erosion, you have work with the tide. Well, the tide line is different from anywhere else we've seen before. When it starts moving in, you have to have a lot of sand when it goes out—it goes out fast. The biggest challenge was maintaining your work area. Because if you have a high tide at any 22' width, well, you gotta have your work area in there at 6 and out at 10:30—well, then you gotta come back at 11, 4 and work 'til dark. And so it's been a completely different kind of thing with the living shore. Well, the way you have to be in a two-by-two meter, and then you have to be a meter over the top of the living in hold it in the beach. Typically on the Eastern Shore, they put the rubble stone behind an existing or bridge over the beach. Well, when we brought in those stones on both sides of the 10-foot bridge, we were having some of that rubble. We wouldn't get our stones to. Well, if you can't get stones to, you can't hold the bridge, the top's gonna float away. The shore turned out to be a little different we had to overcome."



"It's truly been an experience of how and state cooperating."



George E. "Happy" Mayer Jr.

Town of Federalsburg Main Street and
Grass Administrator

"THERE IS AN INHERENT STRESSOR. Now it's gone to the bottom or bottom because if you make a mistake, you're not gonna do. But it's very strong. It's a very strong, and it's only in a single line—point of the shoreline, so-called system. The shore's been as much a part of the community. It's like the old school. It has actually been the way for community how made a living, except as a community of community. How ever the very shoreline the town's been here. The fishing dock is going almost right back to the beginning of the old dock."

Over the years, the dock coming off the land was polluting the nearby Bay. As well as sitting in it. There's been a lot of progress, but the shoreline, they're trying to maintain, so when something major comes, you don't have the whole parking lot into the water. From this parking lot, you can see it's general. It's always gonna be general. Let's make general the general because we know that's the best way to be a general for the shore."

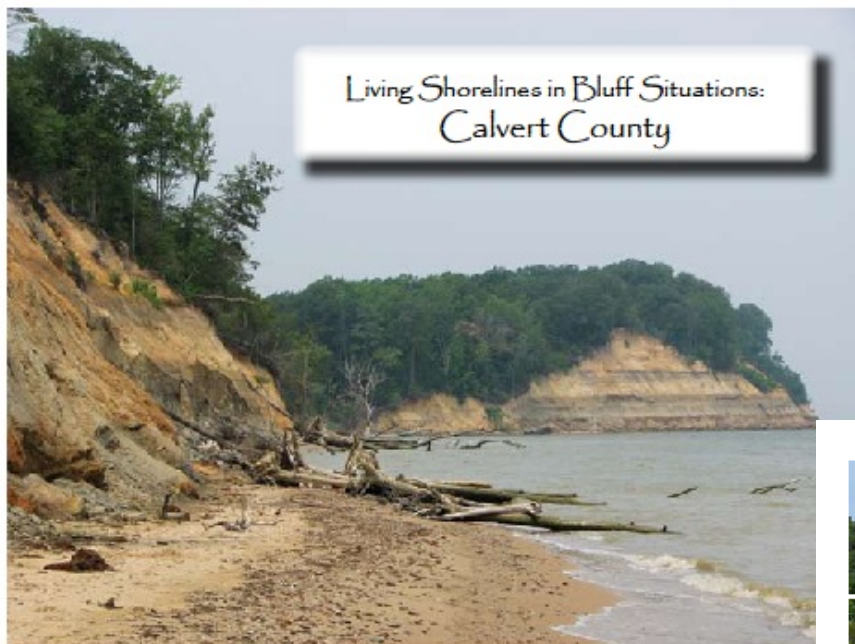
SHORE TO LOSE

Erosion is changing the Chesapeake Bay and its tributaries.



MARYLAND DEPARTMENT OF NATURAL RESOURCES

Homeowners' Workshop



Living Shorelines in Bluff Situations:
Calvert County

You're
invited!!!

Saturday
September
27th, 2008
9 am to 3 pm



Living Shorelines
in Somerset County

You're
invited!!!

Saturday
August 16th,
2008
9 am to 3 pm

Bringing living
shorelines
home to you

MARYLAND DEPARTMENT OF NATURAL RESOURCES

LS Professionals' Workshops



LIVING SHORELINES PROFESSIONALS' TRAINING SESSION

SEPTEMBER 28, 2009
CALVARY UNITED METHODIST CHURCH
301 ROWE BLVD.
ANNAPOLIS, MD 21401

Dear Marine Contractor/Engineer/Consultant,

The State of Maryland passed the new Living Shorelines Protection Act of 2008 into law in October 2008. With this Law, "Living Shorelines" are now the preferred method of shoreline erosion control.

In order to increase awareness about living shorelines and provide information to professionals who are venturing into these projects, a **FREE** training session will be held in Annapolis at the Calvary Church on September 28, 2009 (Monday: 7:00 a.m. – 4:00 p.m.). We cordially invite you to be a part of this event and help to move the science forward.

Though it is a **FREE** event, space is limited. So, please, reserve your spot now! To register contact Dionne Ball, MD Chesapeake & Coastal Program Ph: 410.260.8732 OR dball@dnr.state.md.us.

The topics that will be covered at the event include:

- What are living shoreline projects and why are they needed?
- Surveying shorelines
- Design options and choosing the appropriate practice
- Past projects: What worked and what didn't
- Projects in different energy systems (low, medium, and high)
- Permits and regulatory guidelines
- Technical tools and Shorelines Online
- Quality control of projects
- Optimizing survival of vegetation and aquatic species.

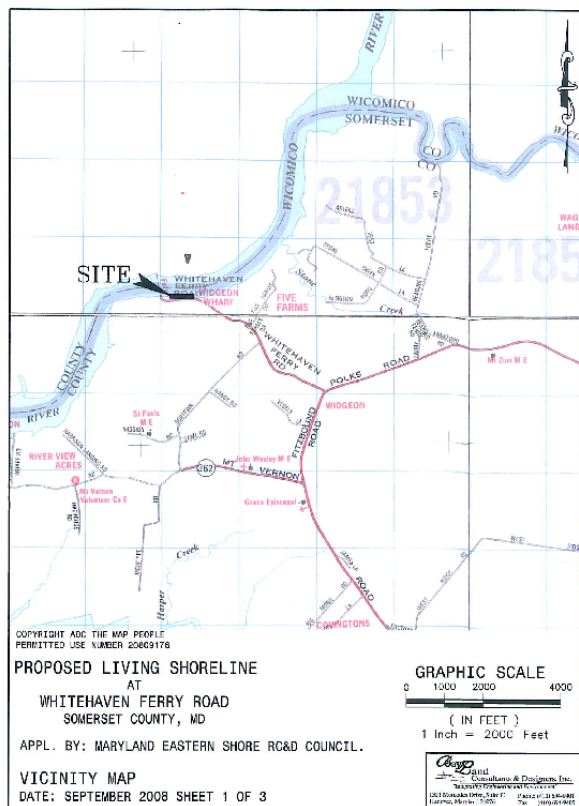
Sincerely,

Bhaaskaran Subramanian
bsubramanian@dnr.state.md.us



Financial assistance provided by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration (NOAA). A publication of the Maryland Coastal Zone Management Program, Department of Natural Resources pursuant to NOAA Award No. NA07NOS419489.





Erosion Rate Study Grant

309-01: Supplemental Project A

Task Title: Calvert County Shore Erosion Rate Verification

Budget:
Federal: \$ 14,659
Non-Federal: \$ 0
Total: \$ 14,659

Project Term: July 1, 2008 - March 31, 2009

Funding Recipient: Maryland Department of Natural Resources
Resource Assessment Service
Maryland Geological Survey

Task Description: In making decisions about development along its tidal shorelines, the Calvert County Department of Planning and Zoning has at its disposal two shoreline change studies - one by a graduate student at the University of Maryland (Downs, 199) and the other by the Maryland Geological Survey (MGS) (Hennessey and others, 2003) which is currently being used for Maryland Shorelines Online (MSO). Both studies involved digitizing historical shorelines and determining shoreline rates of change. However, the two studies differed in their sources and dates of historical shorelines, the digitizing techniques, and, not surprisingly, their results. Discrepancies between the two studies have left county planners in a quandary as to which study better serves their need to make informed decisions.

Downs (1993) analyzed historical shoreline change between 1848 and 1971 along a 60 km stretch of Calvert County, using sixteen NOAA T-sheets (topographic sheets) and two sets of vertical aerial photography (see Appendix 1). In digitizing the sources, Downs used a popular and tested method of the time - metric mapping. The shoreline that she extracted from non-tide-coordinated aerial photos followed the wetted perimeter (wet-dry line) on the beach.

Several years later, MGS mapped shoreline change and determined erosion rates for the reaches of shoreline statewide. For the Chesapeake Bay shoreline bordering Calvert County, the set of historical shorelines spanned the period 1847-1993 (see Appendix 1). MGS digitized seven of the recent (1944 & 1963) NOAA T-sheets that Downs had digitized. However, in lieu of digitizing earlier shorelines directly from NOAA T-sheets, MGS elected to digitize shorelines from an in-house set of Historical Shoreline maps (Cookwright, 1975) derived from those T-sheets. Shorelines depicted on Historical Shoreline maps had been traced from the original T-sheets, projected onto USGS 7.5-minute topographic quadrangles, and redrawn by hand along the bayward edge of the shoreline. MGS subsequently digitized the bayward edge of that hand-drawn shoreline. In addition to T-sheets and maps derived from them, MGS interpreted the land-water interface from non-tide-coordinated digital orthophotographs flown in 1993.



Design Grant

Design Grant

Chesapeake Bay Shoreline Erosion In Maryland: A Management Guide



- Identify areas vulnerable to effects from shoreline erosion over 50 years.
- Provide information using GIS to screen and evaluate potential impacts from shoreline erosion.
- Present data and studies to support shoreline erosion project formulation.

MARYLAND DEPARTMENT OF NATURAL RESOURCES

LS Suitability Study for Counties

Living Shoreline Suitability Model Calvert County, Maryland



Hybrid design option



Soft stabilization

Final Report Submitted to

Coastal Zone Management Program
Maryland Department of Natural Resources
Annapolis, Maryland

Submitted By

Center for Coastal Resources Management
Virginia Institute of Marine Science
College of William and Mary
Gloucester Point, Virginia

funded through grant number NA07NOS4190161/ 14-09-1233 CZM 161



Living Shoreline Suitability Model Somerset County, Maryland



Hybrid design option



Soft stabilization

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MARYLAND DEPARTMENT OF NATURAL RESOURCES

Financing Options in MD

Program	Organization	Contact Information
Shoreline Conservation Services	Maryland Department of Natural Resources (DNR)	Shore Erosion Control Program Phone: (410) 260-87986 Website: www.dnr.state.md.us/grantsandloans/sec.html
Maryland Linked Deposit	Maryland Department of the Environment (MDE)	Water Management Administration Phone: (410) 537-3119 Website: http://www.mde.state.md.us/AboutMDE/grants/index.asp
Small Creeks and Estuaries	Maryland Department of the Environment (MDE)	Water Management Administration Phone: (410) 537-3908 Website: http://www.mde.state.md.us/AboutMDE/grants/index.asp
Living Shoreline Initiative	Chesapeake Bay Trust (CBT)	Phone: (410) 974-2941 Website: www.cbtrust.org
CBT/FAF Partnership	Fish America	Website: http://www.fishamerica.org/grants
Small Watershed Grants	NFWF	Grant Programs; Website: www.nfwf.org

Shoreline Conservation Services Loan Program

MARYLAND DEPARTMENT OF NATURAL RESOURCES
ECOSYSTEM RESTORATION SERVICES
SHORELINE CONSERVATION AND MANAGEMENT SERVICE
(410) 260-8523

FINANCIAL ASSISTANCE FOR SHORE EROSION CONTROL PROJECTS*

TYPE OF PROJECT	TYPE I	TYPE II	TYPE III
TYPE OF FUNDS USED	STATE	STATE	STATE
TYPE OF ASSISTANCE**	LOAN	LOAN	LOAN
LOAN INTEREST	0%	0%	0%
LOAN TERM	5 YEARS	15 YEARS	20 YEARS

Type I Projects: Marsh creation/protection using natural/living materials

Type II Projects: Marsh creation/protection with stone edging, stone sills and/or stone groins, with sand fill and marsh plantings

Type III Projects: Marsh creation/protection with stone breakwaters, with sand fill & marsh plantings

APPLICANT	EXTENT OF ASSISTANCE****		
COMMUNITY ASSOCIATIONS/NON-PROFIT ORGANIZATIONS/SERVICE ORGANIZATIONS	75% NTE \$20,000	100%	100%
MUNICIPALITY - PUBLIC LANDS	75% NTE \$20,000	100%	100%
MUNICIPALITY - SPONSORING PRIVATE OWNERS/BUSINESSES	75% NTE \$20,000	LOAN FORMULA ***	LOAN FORMULA ***
COUNTY - PUBLIC LANDS	75% NTE \$20,000	100%	100%
COUNTY - SPONSORING PRIVATE OWNERS/BUSINESSES	75% NTE \$20,000	LOAN FORMULA ***	LOAN FORMULA ***
COUNTY - SPONSORING COMMUNITIES/NON-PROFIT ORGANIZATIONS/SERVICE ORGANIZATIONS	75% NTE \$20,000	100%	100%

* Financial Assistance provided based on project priority and availability of funds

** Matching grants are not available

*** Loan Formula as established in Natural Resources Article, Section 8-1005 of the Annotated Code of Maryland

Loan Formula:

Project cost	\$0 to \$60,000	100% loan	\$60,000 loan	\$0 Property owner's cash
Next	\$20,000	50/50%	\$10,000	\$10,000
Next	\$20,000	25/75%	\$ 5,000	\$15,000
Above	\$100,000	10/90%		

No financial assistance provided for structural/barrier type projects

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How are MD Projects doing?

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



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Marsh Erosion



No erosion



> 50% erosion

Structure Displacement



Excellent



Displacement

Non-Planted Vegetation



Excellent

Poor



Results

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

Probable Causes of Decreased Performance

- Poor engineering and/ construction.
- Poor execution of Plans.
- “Incorrect” planting.
- Choice of marsh grasses.
- Boat wake.
- Lack of maintenance.



Strengths of the Program

- Increased collaboration between agencies
- Coastal Atlas- huge asset to make more informed decisions and recommendations
- Workshops- effective in getting contractors and agencies to talk to each other instead of “at each other”

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Stumbling Blocks

- Myths and misconceptions (*public & professionals-structural vs LS*): do they work or not?
- Numerous moving parts (*Corps concerns*)
- Cost (*structural vs LS*)
- Habitat conversion and tradeoff (*NMFS concerns*).



How did MD overcome barriers?

- Ongoing process: uphill task
- Dialogue/discussion
- Literature review
- Pre-app meetings
- Demonstration projects
- Mapping products and models



MD's Ongoing Battles

- Contracting community's mistrust of the Regulators.
- Absence of clear guidance-evolving rules and changes in procedures.
- Consistency among Regulators.
- Search for "that model" project
- Standardization, cookie-cut method, etc.



Moving forward...

- More buy-in needed from marine contractors, engineers, etc
- Information such as littoral drift map, LS Suitability models, etc could help
- \$\$\$ to try some innovative and out-of-the-box design for projects
- Consistent permitting process and knowledgeable permit reviewers



Conclusion

- Living shorelines- very effective in “reducing” erosion and creating/ restoring habitats.
- LS Program- many components.
- Collaboration with partners- crucial for a comprehensive program



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