

Living Shorelines & Habitat Restoration

How do we effectively incorporate habitat components into shoreline restoration and enhancement and protect from erosion at the same time?



Hey guys! There's a Living Shoreline right over here.



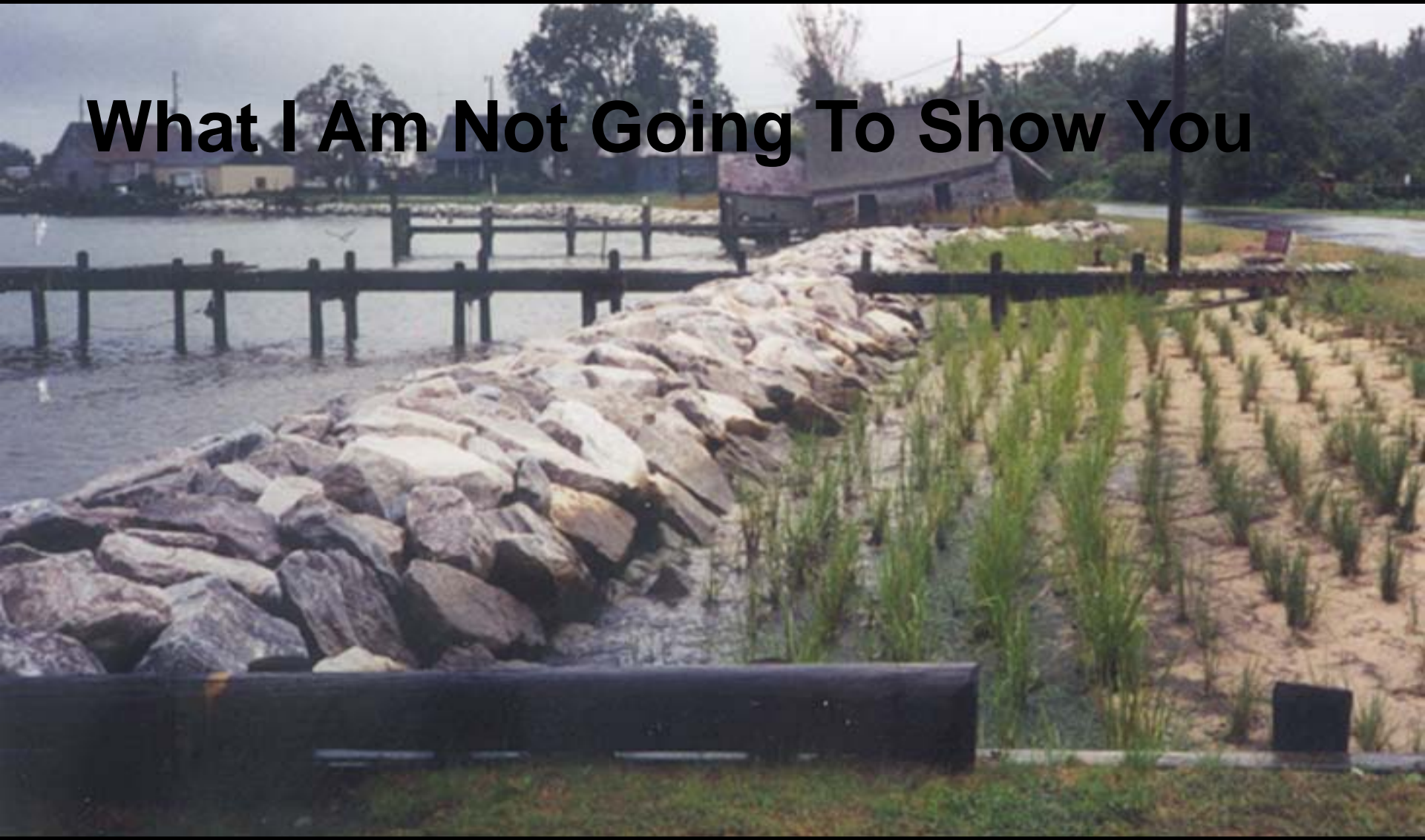
One Definition...

A concept that applies natural principals to shoreline stabilization in order to enhance habitat and maintain dynamic shoreline process.

What are the important words here?

- Dynamic
- Habitat
- Process

What I Am Not Going To Show You

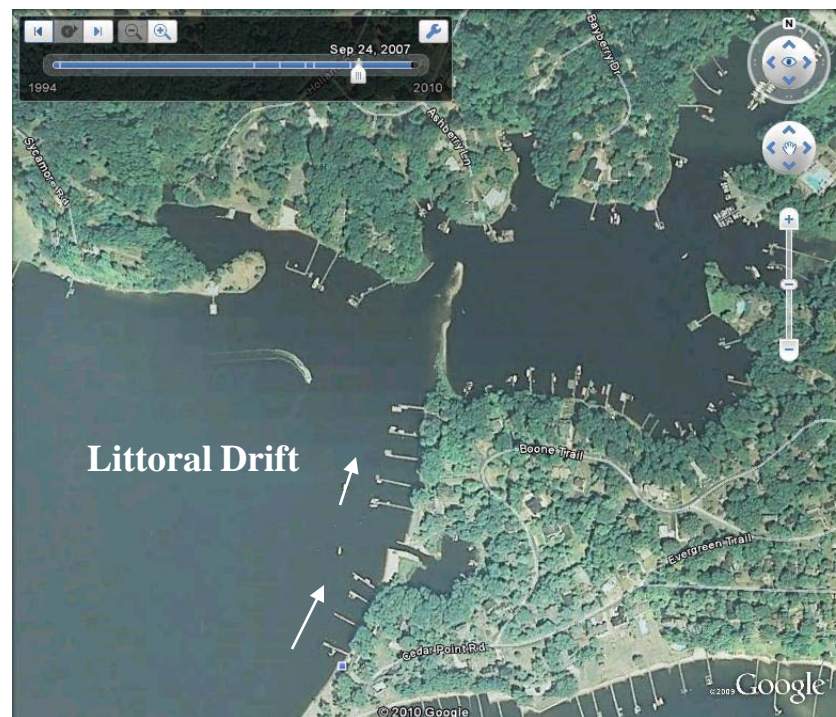


Process

Yantz Cove - 1994



Yantz Cove - 2007









**Some of the Best Shorelines are Those That
Provide for a Diversity of Habitat**





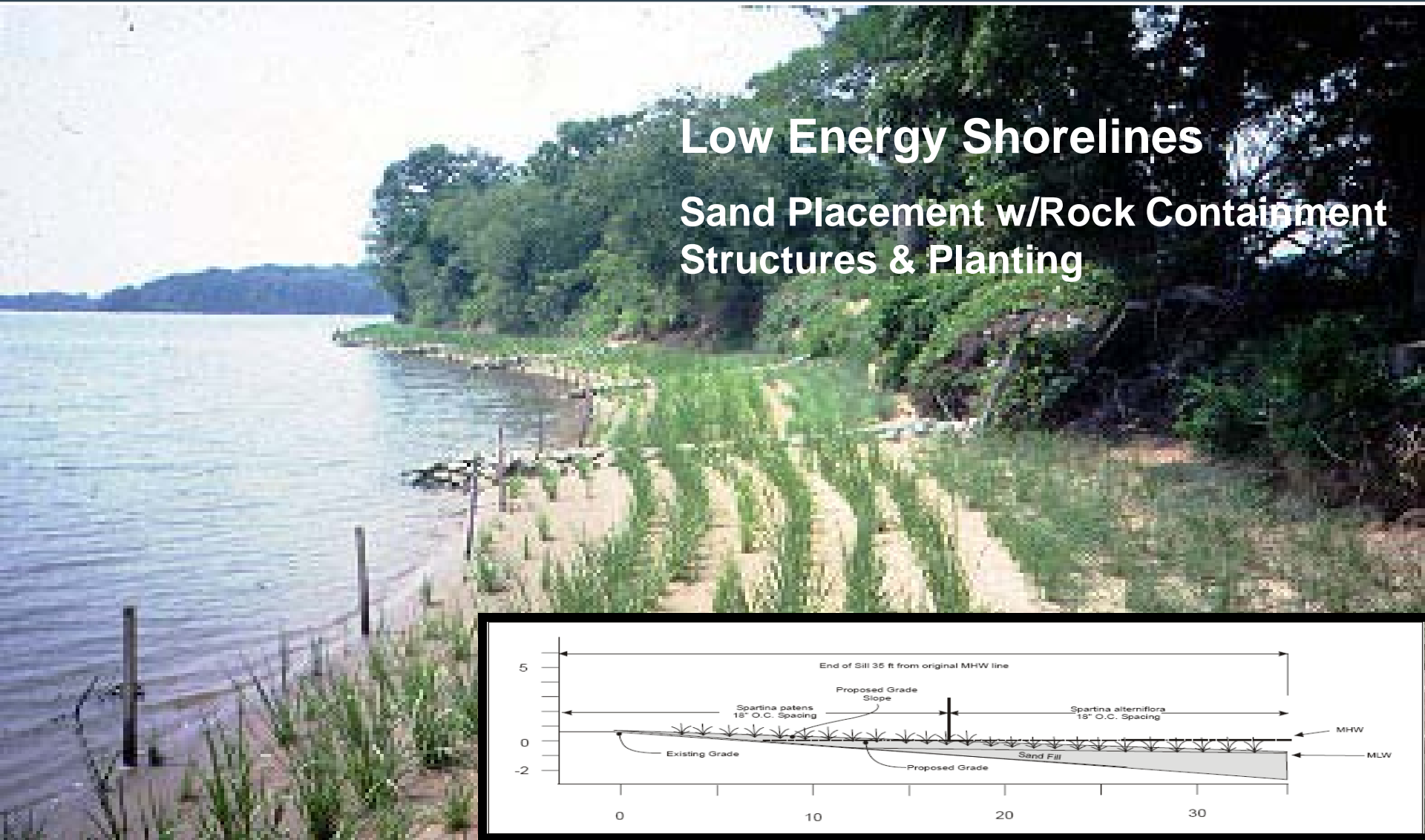
Low Energy Shorelines



After

Low Energy Shorelines

Sand Placement w/Rock Containment Structures & Planting



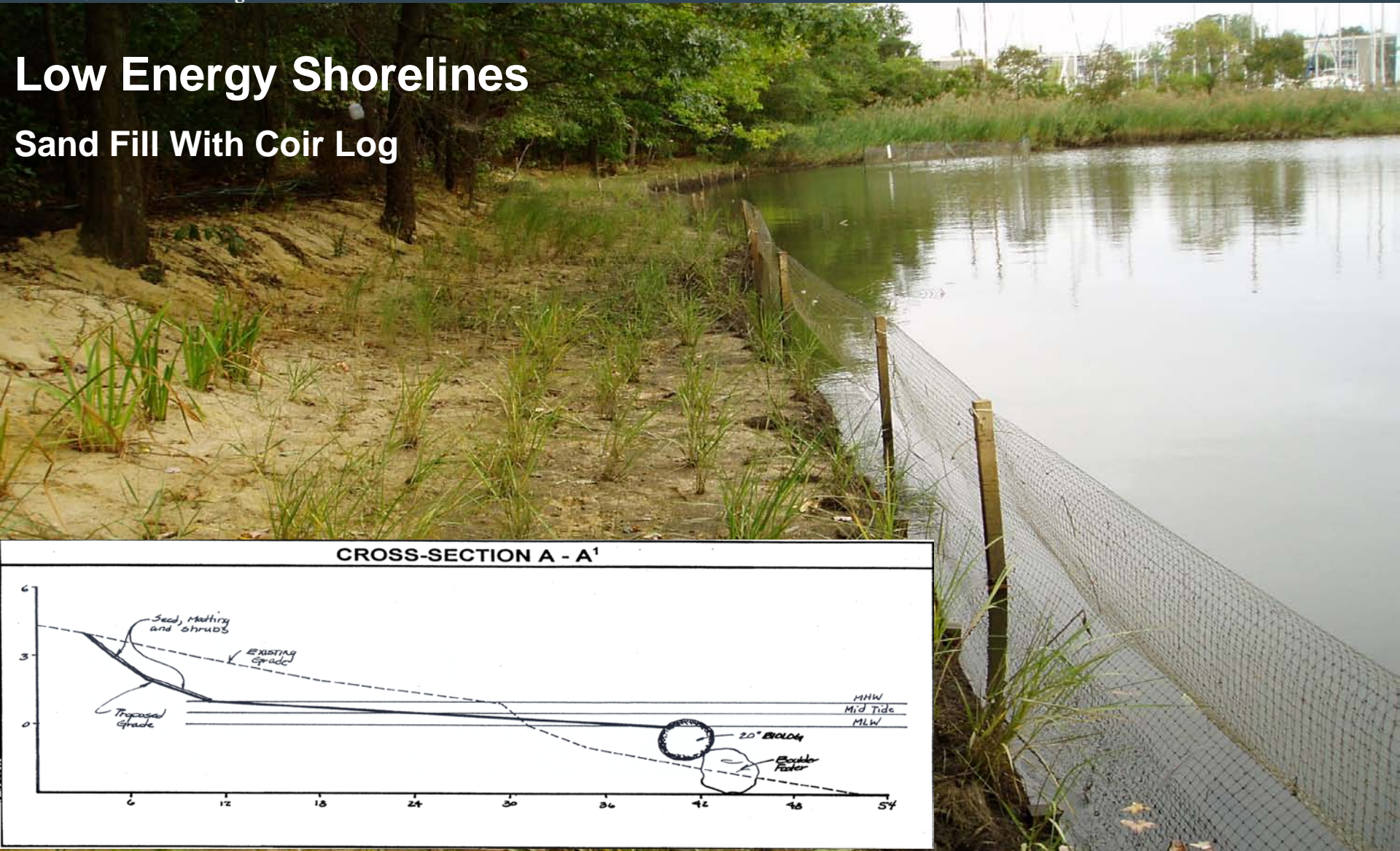
Low Energy Shorelines

Sand Fill with Coir Log



Low Energy Shorelines

Sand Fill With Coir Log



Medium Energy Shorelines

Low Profile Gapped Sills



Medium Energy Sites

Pre-Construction



Low-Profile Gapped Sill

During Construction



6 Months After Construction



Medium Energy Sites

Severn River

Marsh Breakwater Project



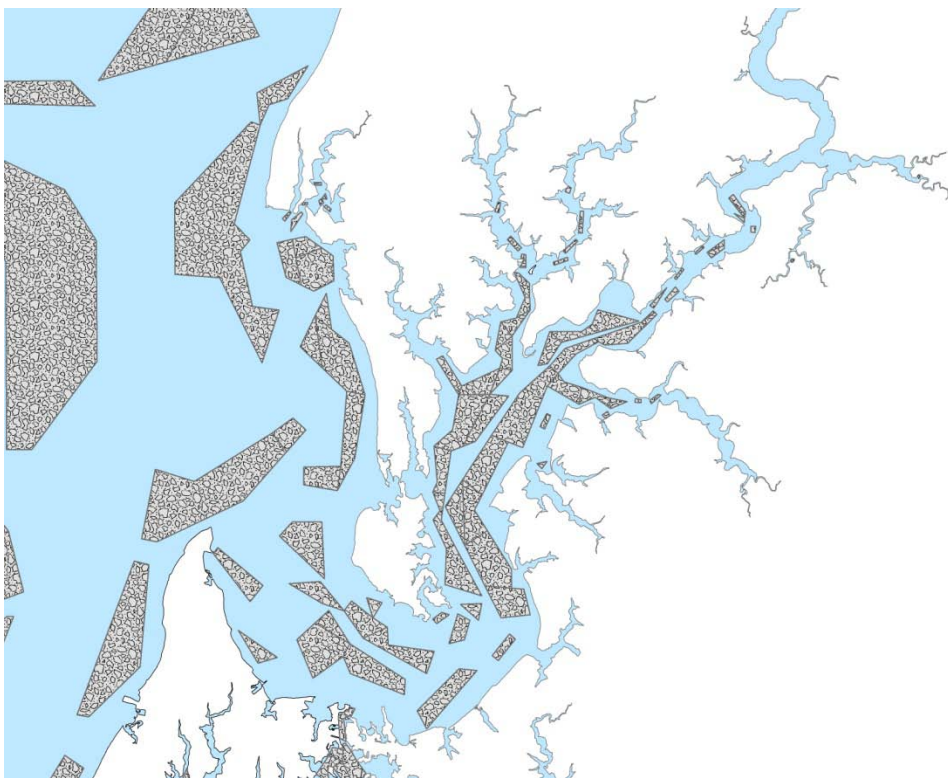
Higher Energy Sites

Offshore Considerations



Oyster Bottom Survey Completed in the Early 1900's

Chester River Area



Oyster Reef in Virginia



Coastal Shoreline Profile & Living Shoreline Treatments



Graphic courtesy Burke Environmental Associates

**Riparian Vegetation
Management**

Bank Grading

Fiber Logs

**Tidal Marsh
Enhancement**

Tidal Marsh Creation

**Beach Nourishment &
Dune Restoration**

Marsh Toe Revetment

Marsh Sill

Marsh With Groins

Living Breakwater

Offshore Breakwater System

Oyster Reef

High Energy Sites

Headland Breakwaters



Before

After

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Ecosystem Restoration Services

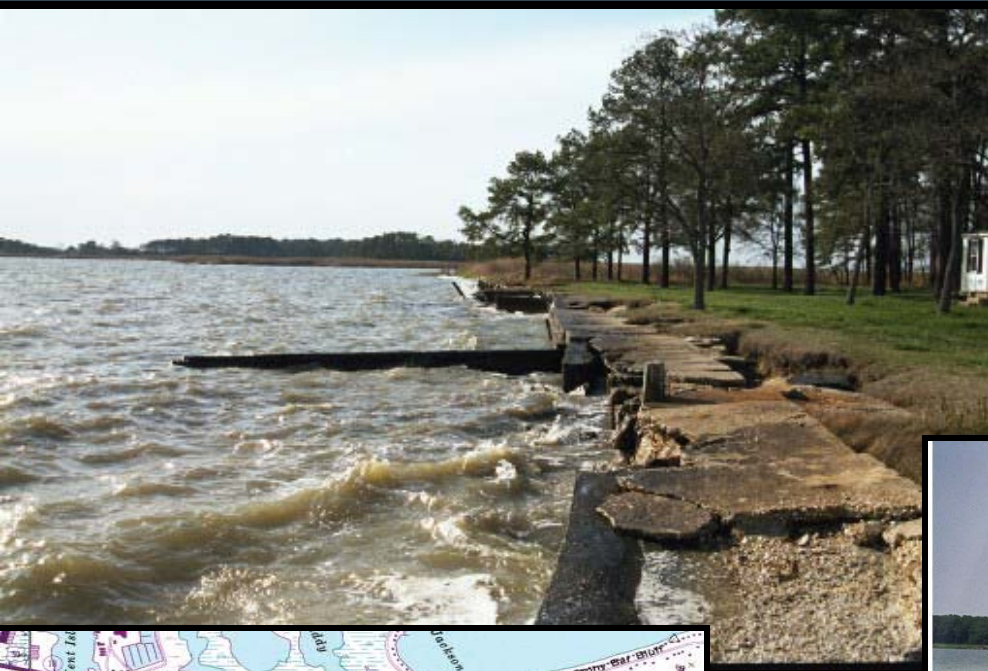


Marsh Breakwaters

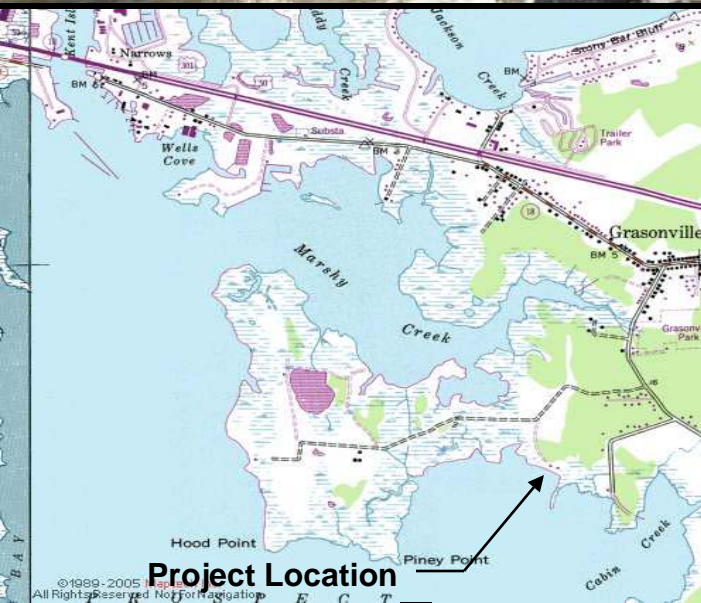
Submerged Oyster Reef

Eastern Bay

Horsehead Living Shoreline Project



Horsehead Environmental Ctr.



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Ecosystem Restoration Services

During Construction



After construction

Offshore Structures Colonized By:



**Mussels, Clams,
Oysters,
Barnacles...**

Level of Protection vs. Habitat



Vegetation

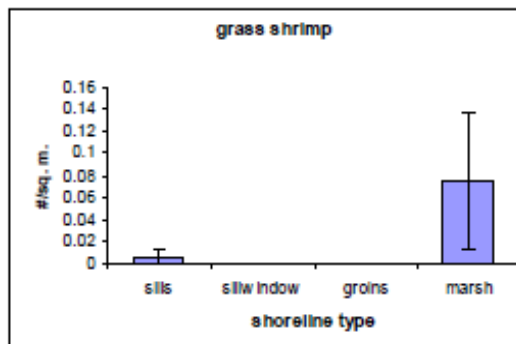
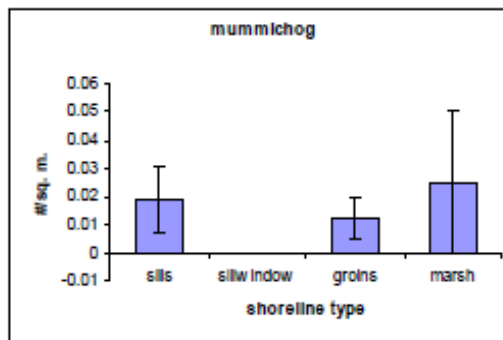
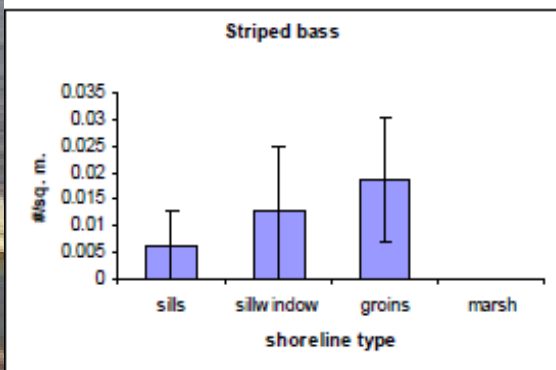
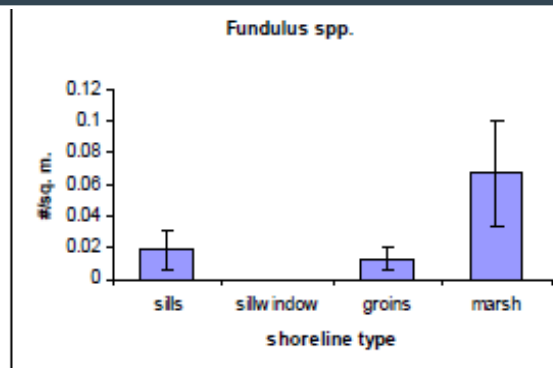
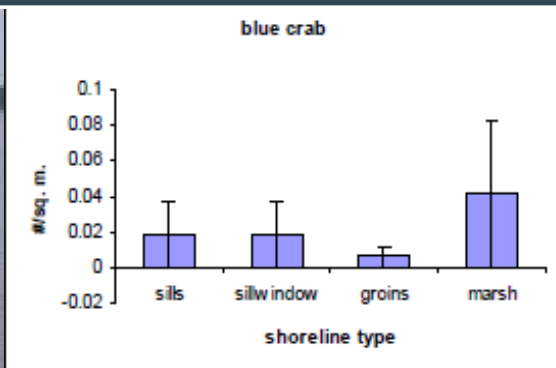


Woody Debris



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Ecosystem Restoration Services



What Have We Learned Over the Last 37 Years

No. 1: Appropriate techniques in the appropriate location — No one technique works for each site. Each site has its own peculiarities and each design should be developed individually.

No. 2: Learning how to better balance “habitat” with “shoreline protection”.



Living Shorelines Are Good For People Too



Questions?

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