



Living Shoreline Treatments, Tactics, & Techniques in the Delaware Region



2016 Delaware Living Shoreline Workshop



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& Senior Restoration Ecologist
Sovereign Consulting, Inc.*

Treatments, Tactics, and Techniques Being Used

- **DELSI Hybrid** (DELSI in conjunction with shell bags and oyster castles)
- **Cupped Wave Spreader Treatment** (100% green, all log treatment – moderate energy)
- **Tidal River Vegetated Mud Sill Treatment** (nearly 100% green, log cells with plantings – low to moderate energy)
- **Wave Attenuation Device (WAD™)** (specially designed structural units to provide for ecological up lift – moderate to very high energy).



DELSI Hybrid– Mispillion Lighthouse, DE (Cedar Creek-Mispillion River Confluence, Kent/Sussex County Line, DE)



DELSI Hybrid– Mispillion Lighthouse, DE (Cedar Creek- Mispillion River Confluence, Kent/Sussex County Line, DE)

*A pretty neat project,
with a complicated energy
paradigm*



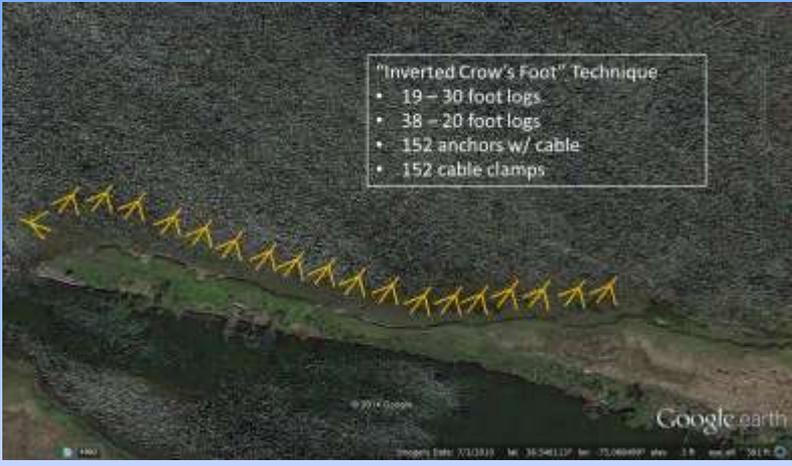
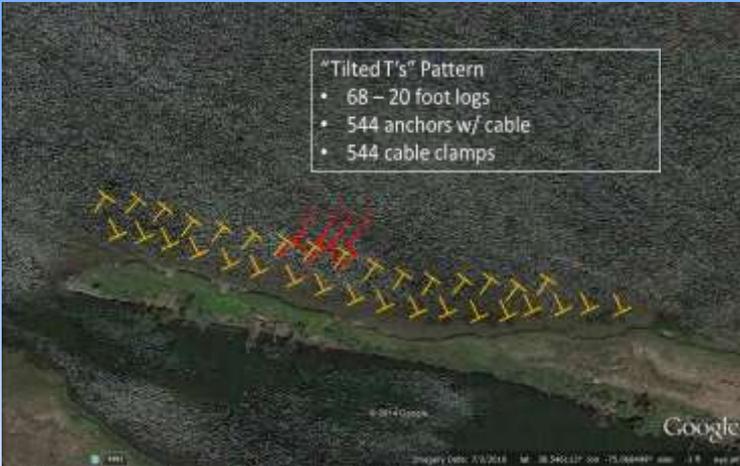
- DELSI Tactic
- DELSI Tactic Hybrid
- Oyster Castles
- Shell Bags

Thank you, Partnership for the DE Estuary for sharing

DELSI Hybrid– Mispillion Lighthouse, DE (Cedar Creek- Mispillion River Confluence, Kent/Sussex County Line, DE)



Cupped Wave Spreader – Loop Canal, Bethany Beach, DE

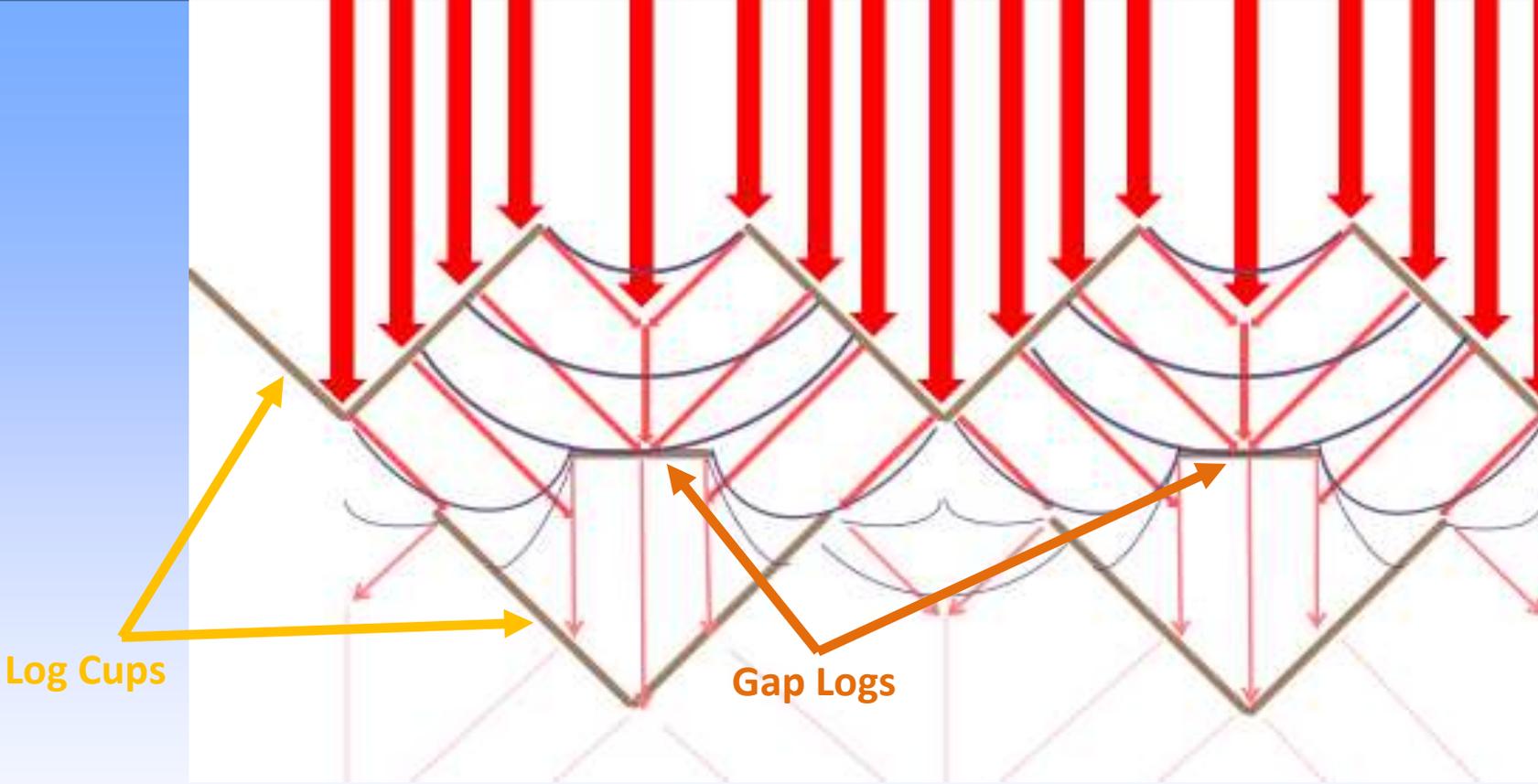


Alternative Configurations



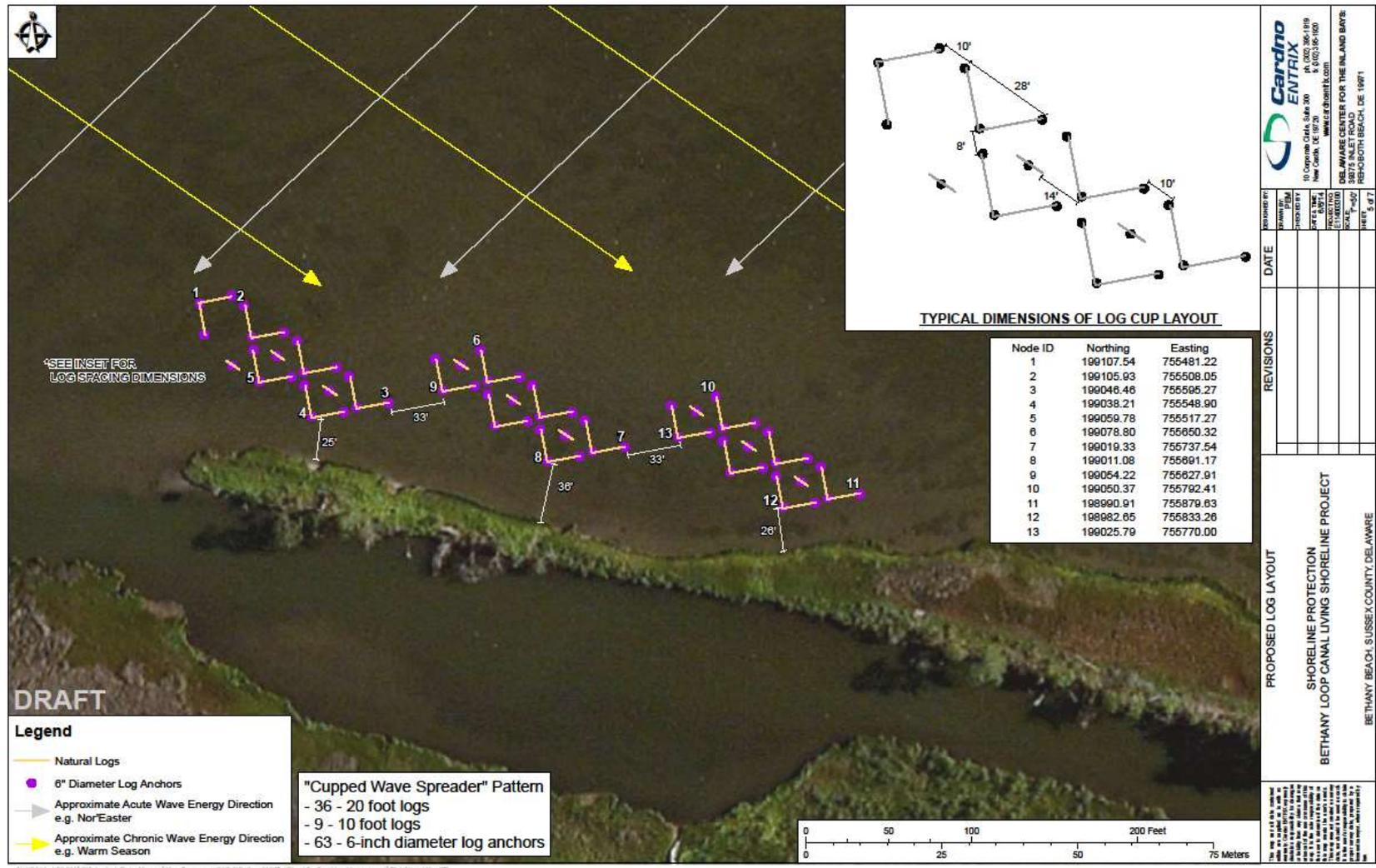
Thank you, Delaware Center for the Inland Bays for sharing

Cupped Wave Spreader – Loop Canal, Bethany Beach, DE



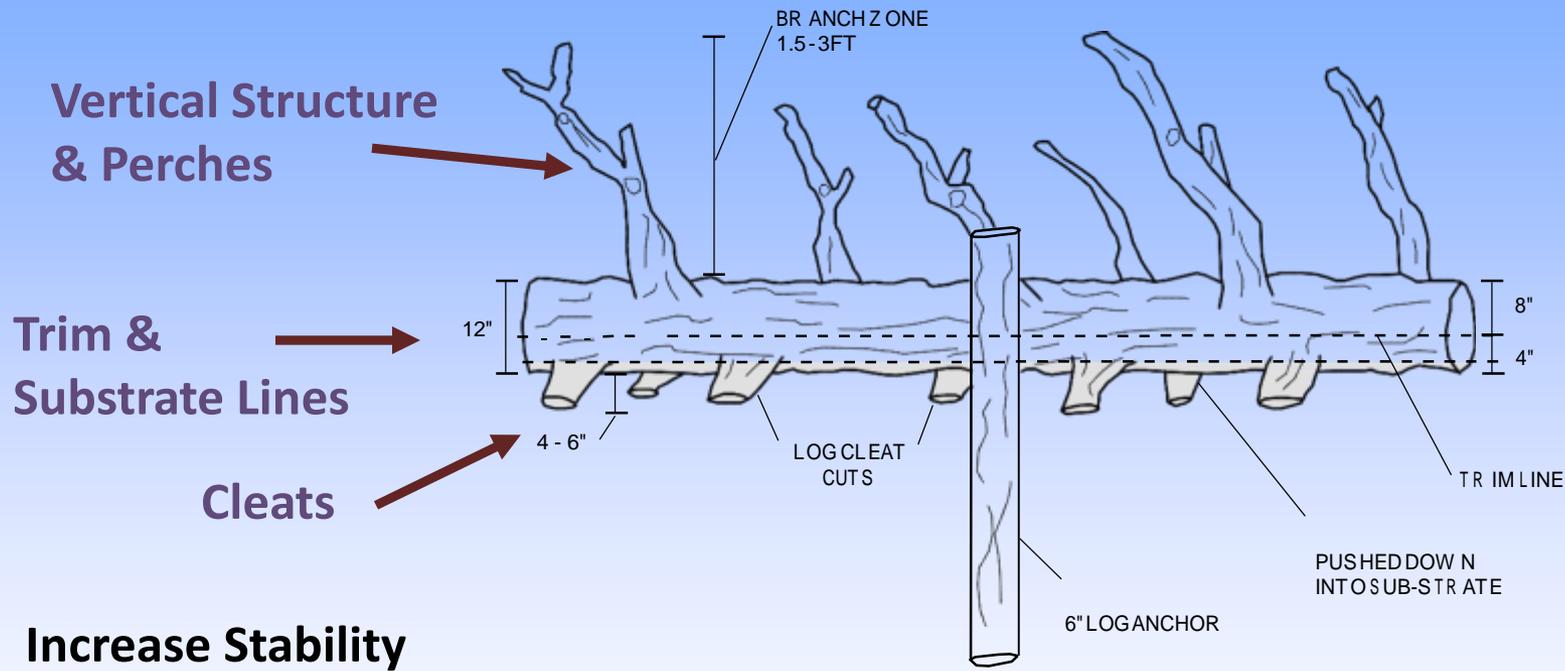
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Cupped Wave Spreader – Loop Canal, Bethany Beach, DE



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Cupped Wave Spreader – Loop Canal, Bethany Beach, DE



- Increase Stability
- Reduce Construction Costs
- Increase Eco Uplift

**Gap Log Detail
(cross section, n.t.s.)**

Thank you, Delaware Center for the Inland Bays for sharing

Tidal Mud Sill – Marshyhope Creek Federalsburg, MD (Eastern Shore)



- Tributary to the Nanticoke R., tidal, maintained navigable channel
 - Chronic Wake Action + Highly Erodible Soils
 - 1'-3.5' vertical bank near high tide line
- BUT...
- Creek edges had gentle, consistent slopes, conducive for living shoreline design

Tidal Mud Sill – Marshyhope Creek, Federalsburg, MD (Eastern Shore)



← Low Tide

High Tide →



Photographs provided by Duffield Associates, Inc.



Tidal Mud Sill – Marshyhope Creek, Federalsburg, MD (Eastern Shore)

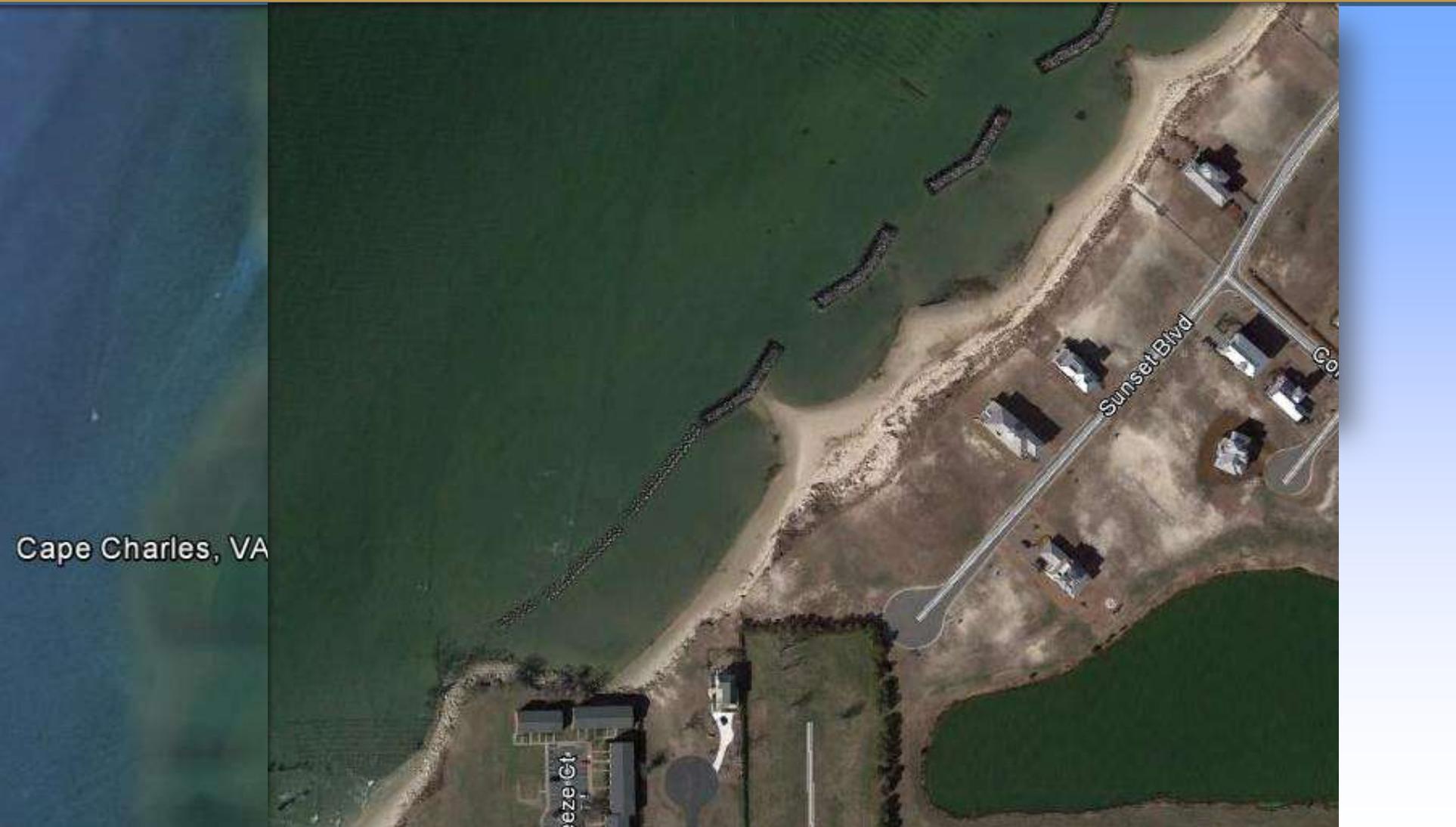


Early 2014

Photographs provided by Duffield Associates, Inc.



Living Shorelines Work In High Energy Systems, Cape Charles, VA



WAD Technology at Work



Video provided by Living Shoreline Solutions, Inc.



SOVEREIGN CONSULTING INC.
AN ENVIRONMENTAL SERVICES FIRM

Living Shorelines Work In High Energy Systems, Cape Charles, VA

December 2015

This is passive accretion; self-healing and resilient!

How much would it cost to mechanically bring this amount of material in, maintain it, and replace it?

*Thank you LSS, Inc., Dade City, FL & Mid Atlantic Environmental LLC, Virginia Beach, VA for sharing photos
monitoring photography*



Thank You

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A typical summer evening at The Point