

Living Shorelines Workshop

A Coastal Engineer's Perspective

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Living Shoreline vs. "Mitigation"

- > There are actually few "living shoreline" projects in CT that are purposely designed and installed to preserve and protect a shoreline that are not a result of need for mitigation.
- > WHY?

Engineer's Reservations	Owner's Reservations
Lack of Design Criteria	Level of Protection Vs. Harder Structures
Need for Maintenance / Adaptive Management	Lack of Local Examples
Level of Protection Vs. Harder Structures	"No Guarantees"
Narrow Definition of "Living Shorelines"	Lack of Physical Land/ Property Encroachment

Lack of Design Criteria/Standards

- > Waves (including boat wakes)
- > Currents
- > Ice
- > Shoreline slope
- > Soil conditions
- > Plant species and tolerance to above
- > Optimum dimensions of sill for various conditions
- > Metrics for monitoring

Common Project Performance Factors

- > Forensic studies undertaken by Hudson River Sustainable Shorelines Project (NYSDEC, Consensus Building Institute, Stevens Inst. of Technology) to identify critical factors for performance during Storms Lee, Irene and Sandy
 - > Common factors for failure:
 - > Debris impacts
 - > Undersized and/or not properly graded stone
 - > Improper slopes (1:10 or less steep ideal)
 - > Not accounting for ice
 - > Flood water recession
 - > Common factors for success:
 - > Development and implementation of monitoring and maintenance protocols
 - > Adaptive management
 - > Maturity of vegetation (temporary stabilization measures in place to allow)
- > More research needed for physically-based design guidance

Cedar Point Yacht Club, Westport, CT

Vegetated bank in relatively calm marina basin experiencing some erosion. Adjacent to road which provides the only access point to Club and several homes.



Cedar Point Yacht Club, Westport, CT

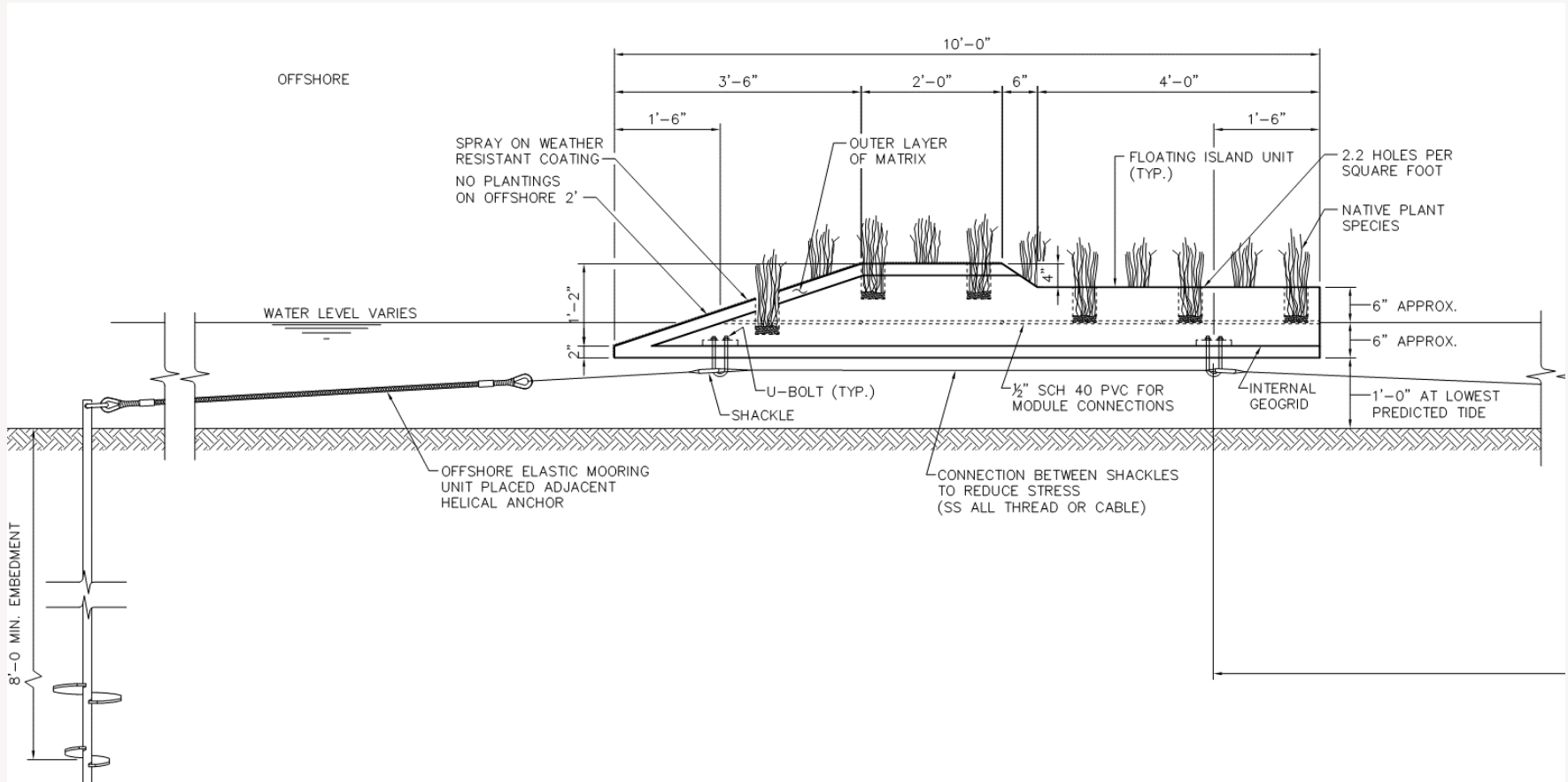
Living shoreline consisting of rock-filled gabion mattress proposed to CTDEEP but "rejected" through pre-application process and rock-sill proposed by CTDEEP as an alternative. Compromise of coir mattress and logs currently under review.



Incentives for Increased Living Shoreline Proposals

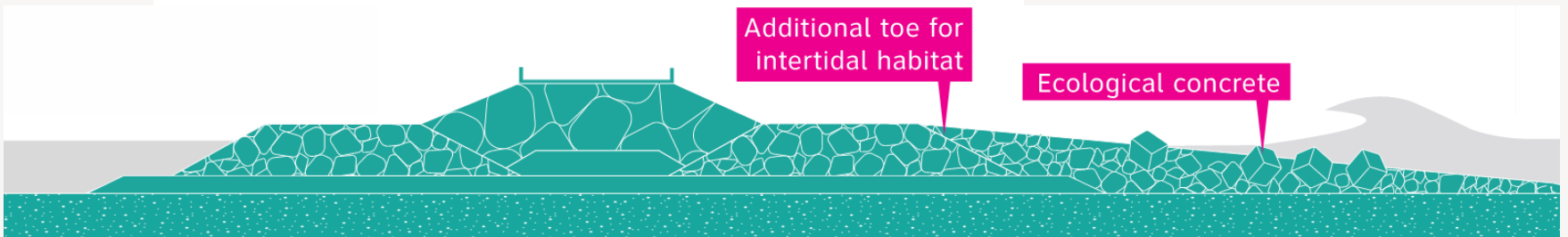
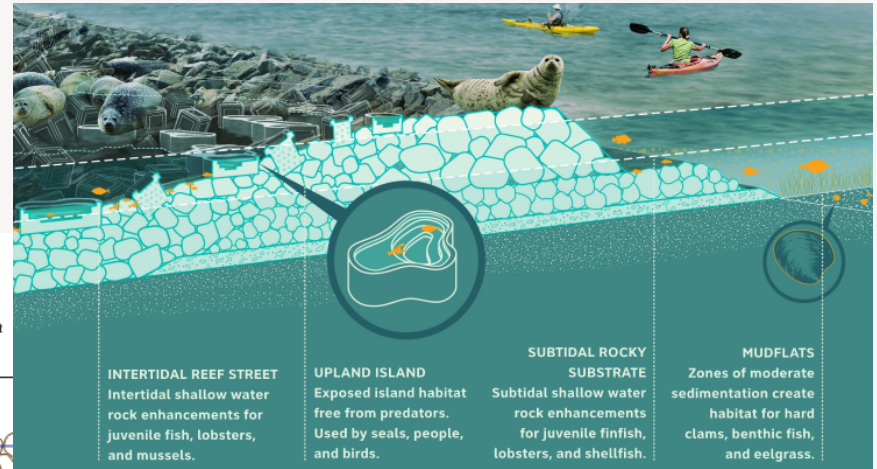
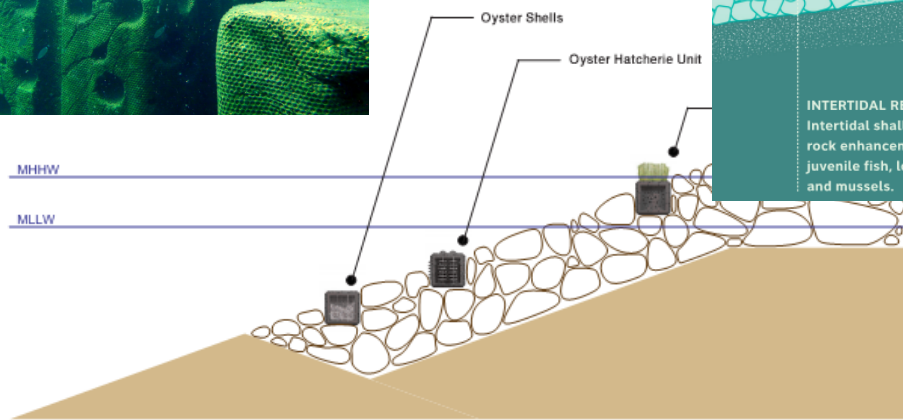
- > Design tools and criteria/standards
- > General permit eligibility or shorter review period
- > Allowances for adaptive management
- > Increased ability to try something more robust for repeated failures
- > Grants
- > Open-mindedness for potential alternatives, still considered living shorelines or "Green Infrastructure"
 - > Oyster breakwaters
 - > Vegetated floating wave attenuator islands
 - > Ecologically enhanced bulkheads and revetments

Example OCC | COWI "Green Infrastructure" Projects



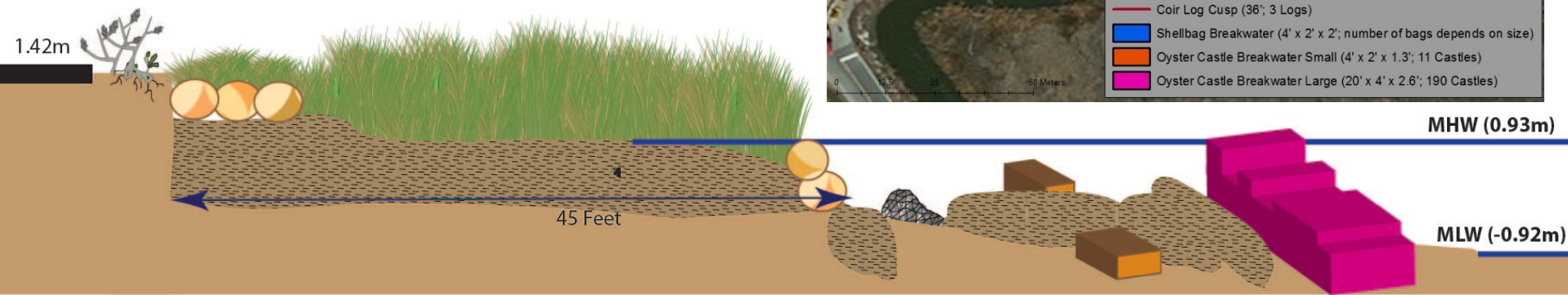
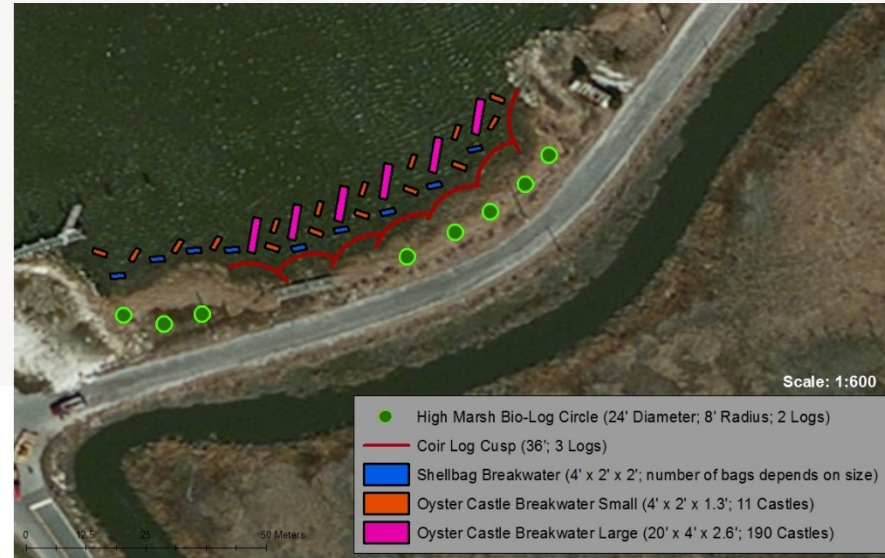
Floating Island Wave Attenuator, Jamaica Bay, NY

Rebuild By Design: Living, Growing Breakwaters Staten Island & Raritan Bay, NY



The Nature Conservancy Gandy's Beach Living Shoreline, Delaware Bay, NJ

Hybrid living shoreline including oyster reef breakwaters



Cor Fiber Log



Sm Oyster Castle Breakwater 4' x 2' x 2'



Lg Oyster Castle Breakwater 20' x 4' x 2.6'



Shellbag Breakwater 4' x 2' x 2'



New Sediment Post Installation