Wetland Rules
TIDAL SHORELINE STABILIZATION

Eben Lewis, Southeast Region Supervisor
NHDES Wetlands Bureau, Pease Field Office
October 10, 2019

"Time and tide wait for no man."

~Geoffrey Chaucer

TIDAL SHORELINE STABILIZATION

Env-Wt 609

Agenda

1. Similarities/differences with previous rules
2. Introduction to general criteria
3. Analyze data
4. Techniques

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

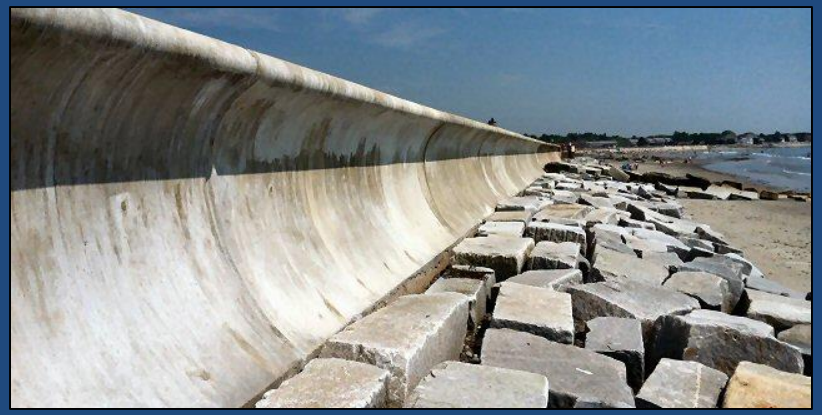
TIDAL SHORELINE STABILIZATION
Existing Rules

Env-Wt 404.04 Rip-rap.

- Demonstrated factors making other stabilization methods impractical
- PE design/stamped plan for riprap over 100 linear feet

Env-Wt 404.05 Walls.

- Lack of space
- Minimize reflecting wave energy



NEW HAMPSHIRE DEPARTMENT OF Environmental Services

TIDAL SHORELINE STABILIZATION
Existing Rules

Env-Wt 404.03 Vegetative Stabilization.

(a) Natural vegetation shall be left intact to the maximum extent possible. If space and soil conditions allow, unstable banks shall be cut back to a flatter slope, seeded, and replanted with native, non-invasive trees and shrubs.

(b) If space relative to the highest observable tide line, water turbulence, and soil conditions allow, the project shall include vegetation of existing sand beach or dunes or construction of vegetated sand dunes.

TIDAL SHORELINE STABILIZATION
Existing Rules

Minimum

Repair work/work above the HOTL

Minor

New work above HOTL exceeding 50 linear feet

Major

Work in tidal waters/ >100 linear feet

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TIDAL SHORELINE STABILIZATION
New Rules
Env-Wt 609

63 New definitions!

6 Pages of new rules specific to tidal shoreline stabilization!

TIDAL SHORELINE STABILIZATION

Env-Wt 609

General Criteria for Tidal Waters/Wetlands.

Projects in tidal surface waters or tidal wetlands shall:

- Optimize the natural function of the tidal wetland, including protection or restoration of habitat, water quality, and self-sustaining stability to storm surge;
- Be designed with a preference for living shorelines over hardened stabilization practices

-Env-Wt 604.03

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TIDAL SHORELINE STABILIZATION

Existing Rules vs New Rules

Minimum

Repairs/work above the HOTL & Restoration work

Minor

Work in tidal waters/ >100 linear feet

Major

Work in tidal waters/ >100 linear feet

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TIDAL SHORELINE STABILIZATION
Existing Rules vs **New Rules**

Minimum

Repairs/work above the HOTL, Conversion to bioengineering, Living shoreline exposed at HT & Restoration work

Env-Wt 609.10

Minor

New hard structures and increase of hard structures

Major

Within sand dune, tidal wetlands, and undeveloped TBZ

Env-Wt 609.11

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TIDAL SHORELINE STABILIZATION

Living shoreline

A management practice that provides erosion control benefits, protects, restores, or enhances natural shoreline habitat, and maintains coastal processes through the strategic placement of plants, stone, sand fill, and other structural organic materials, maintaining the continuity of the natural land-water interface while providing habitat value and protecting against coastal hazards.

-Env-Wt 602.29

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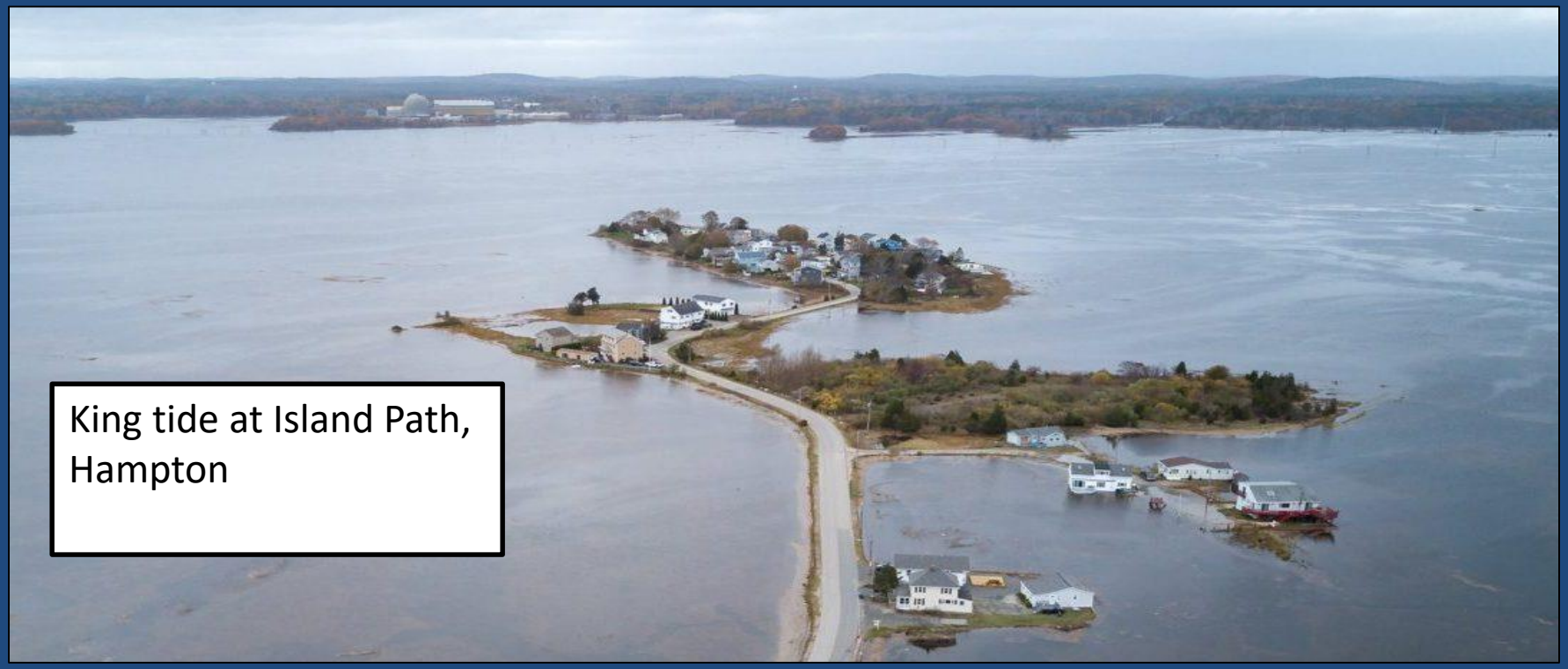
Env-Wt 609 TIDAL SHORELINE STABILIZATION

Coastal hazards

Natural phenomena in coastal areas, such as sea level rise coastal storms, hurricanes, flooding, and erosion that occurs rapidly in a single event or gradually, that have the potential to damage property including infrastructure, degrade the environment including habitat displacement,

and threaten human life or safety.

-Env-Wt 602.08



King tide at Island Path, Hampton

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TIDAL SHORELINE STABILIZATION

Applications for tidal shoreline stabilization projects shall demonstrate that:

- The technique or combination of techniques is based on best available scientific and engineering practices; and
- The proposed technique or combination of techniques addresses:
  - Results of the avoidance and minimization and mitigation.
  - The CFA.
  - The project design narrative.
  - Any causes of erosion that can be identified.
  - The degree or extent of erosion.
  - Relative exposure based on shoreline geometry, shore orientation, intensity of boat traffic, influence of adjacent structures, storm surge, and extreme precipitation events.
    - New Hampshire Living Shoreline Site Suitability Assessment.
  - Potential sea-level rise and vulnerability assessment .
  - Potential marsh migration as a result of sea level rise as shown on the Sea Level Affecting Marshes Model (SLAMM) Wetlands Bureau OneStop mapper.

Env-Wt 609.02

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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  - Relative exposure based on shoreline geometry, shore orientation, intensity of boat traffic, influence of adjacent structures, storm surge, and extreme precipitation events.
    - New Hampshire Living Shoreline Site Suitability Assessment (L3SA).

Env-Wt 609.02

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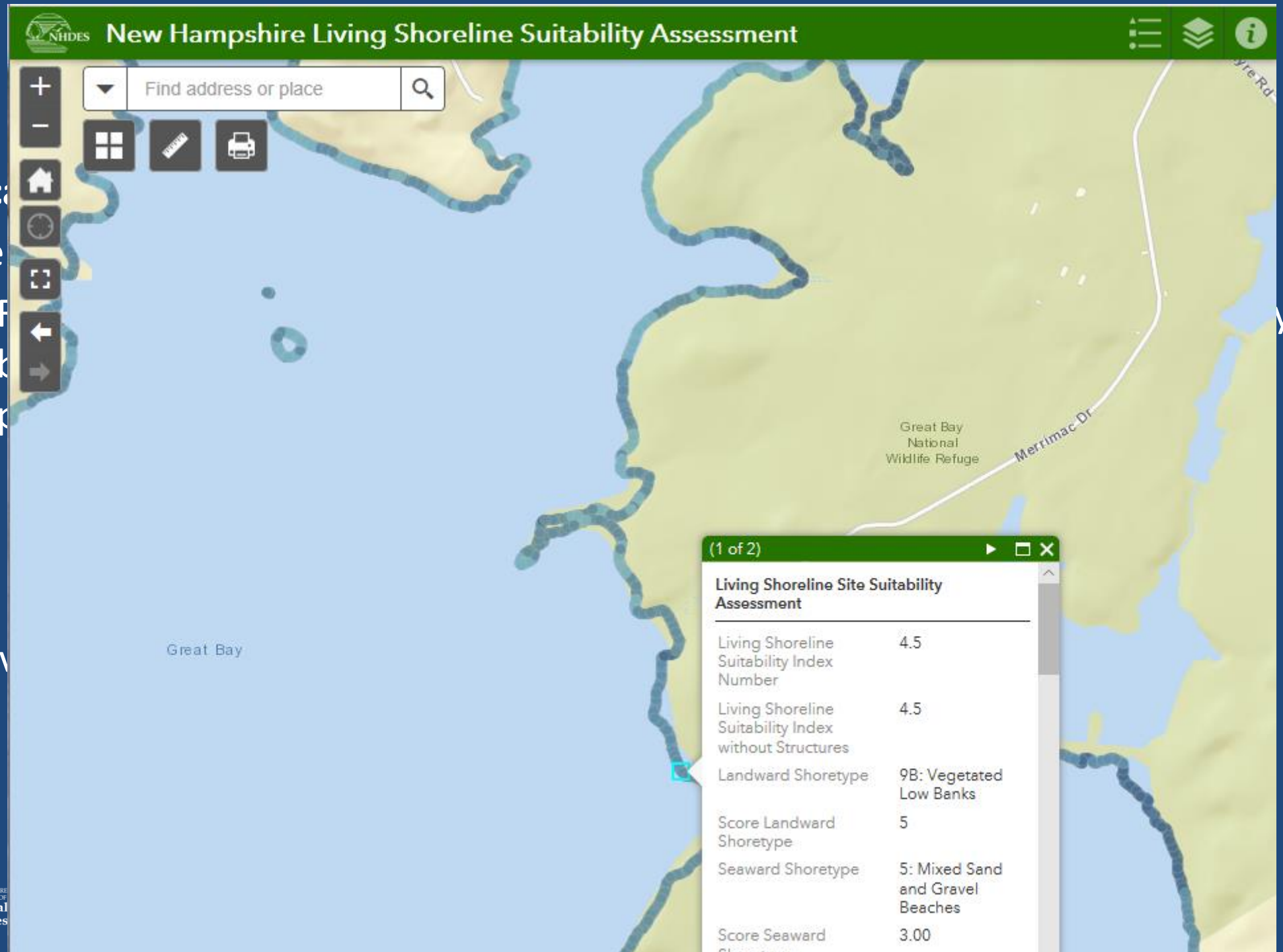

TIDAL SHORELINE STABILIZATION

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Env-Wt 609.02

TIDAL SHORELINE STABILIZATION

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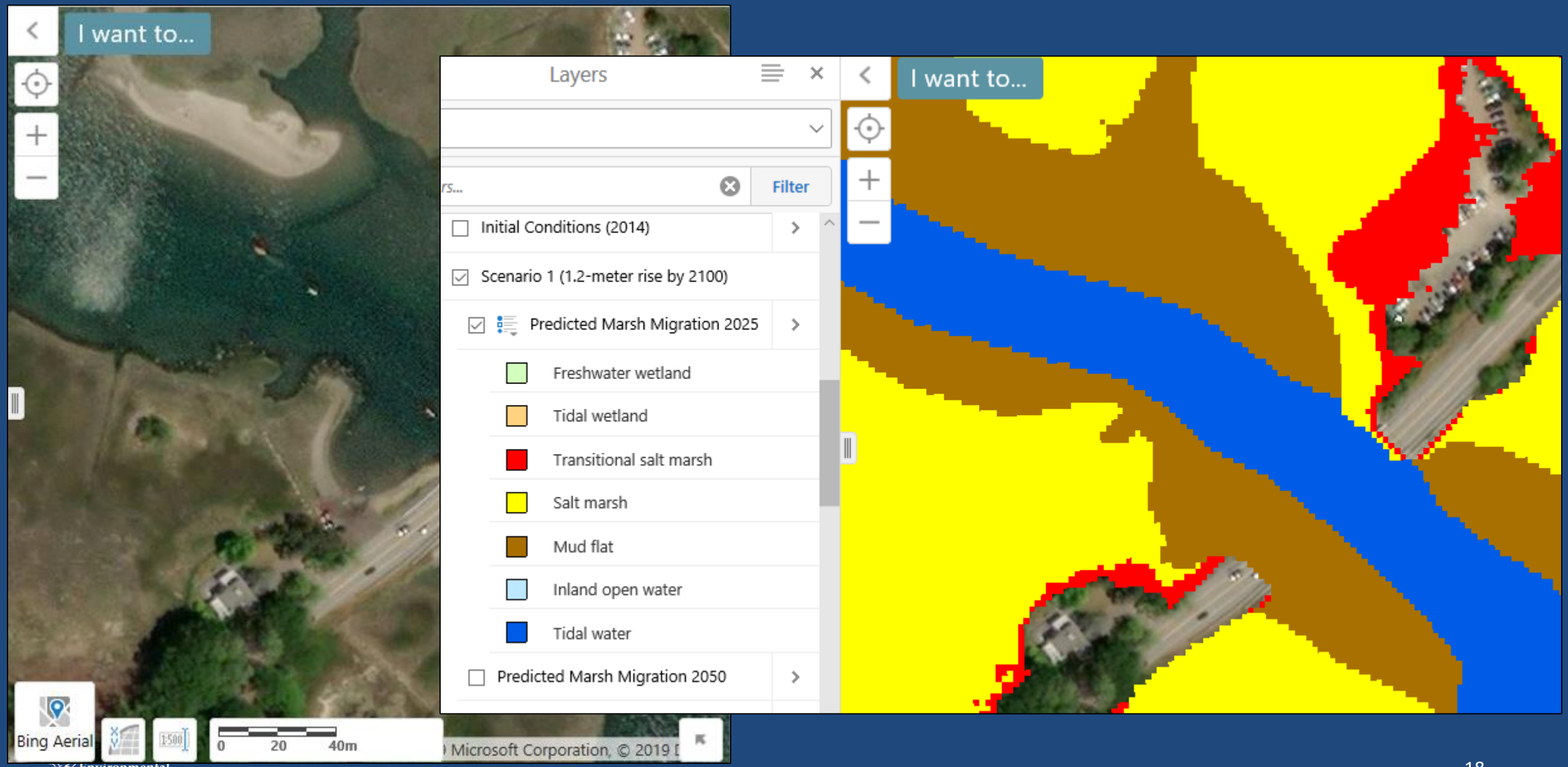
Env-Wt 609.02

TIDAL SHORELINE STABILIZATION



Environmental Services

TIDAL SHORELINE STABILIZATION

Tidal Shoreline Stabilization Requirements.

Tidal shoreline stabilization projects shall:

- Maintain or enhance the natural process functions of the shoreline
- Provide wildlife habitat
- Protection against coastal hazards;
- Be compatible with the existing natural land cover and its functions;
- Address the known causes of erosion; and
- Avoid adverse impacts to nearshore ecosystem processes and habitats and adjacent shoreline.

Env-Wt 609.01

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TIDAL SHORELINE STABILIZATION

Analysis of Existing Structure Conditions.

- The degree of damage or extent of deterioration.
- Whether the existing installation has functioned as intended.
- Whether opportunities exist to use soft bank stabilization components or a combination of soft and hard components, and
- The ability of the structure to withstand coastal flood risk in accordance with the vulnerability assessment.

Env-Wt 609.03

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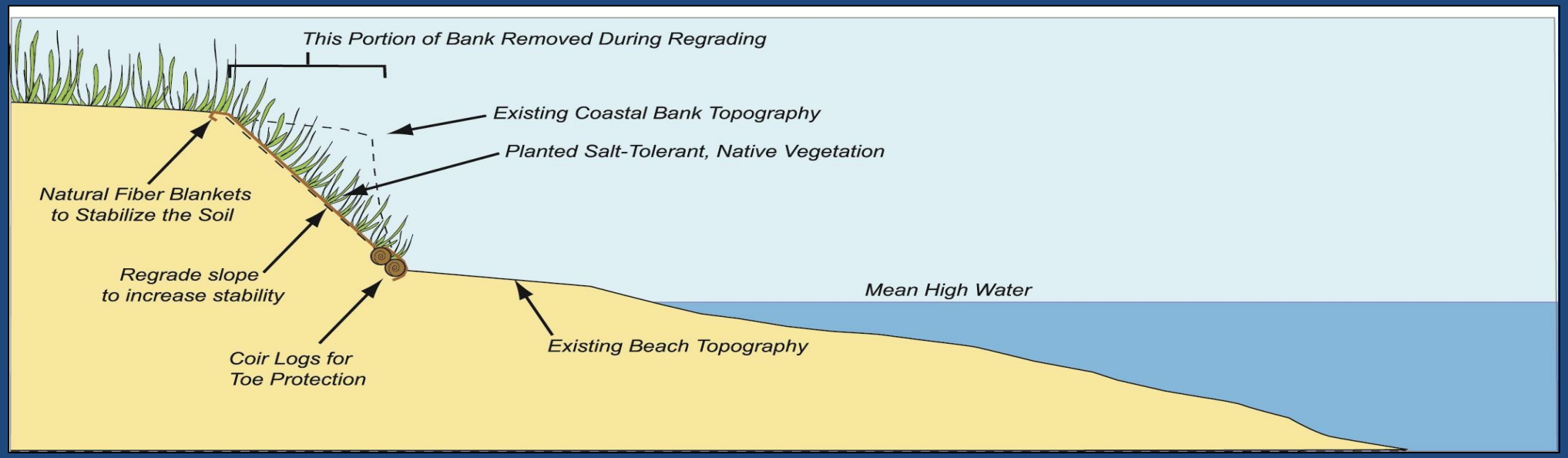
Env-Wt 609 TIDAL SHORELINE STABILIZATION

Techniques for Tidal Shoreline Stabilization. Env-Wt 609.04

- Tidal shoreline stabilization shall be accomplished using living shoreline techniques unless the applicant demonstrates that a living shoreline is not practicable.

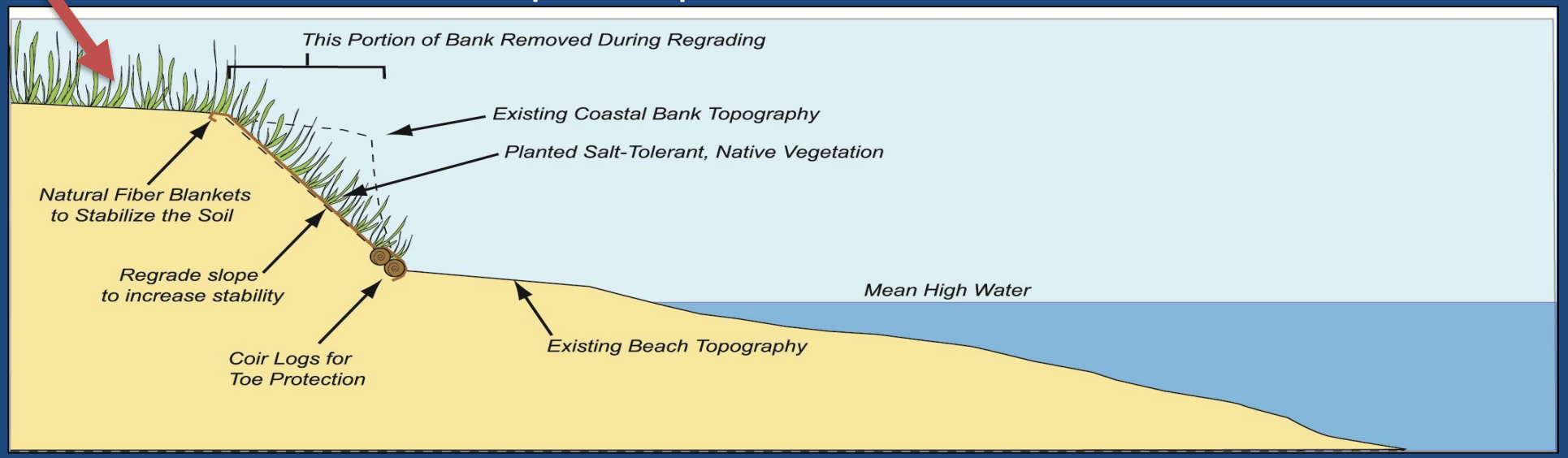


Env-Wt 609 TIDAL SHORELINE STABILIZATION

Living Shoreline Design Plans.

- A plan shall be prepared and stamped by a professional engineer and reviewed relative to delineations of wetlands and stamped by a certified wetland scientist
  - Use native vegetation, sand fill, and limited stone or wood protection and mimic the natural landscape
  - Design the sill to the lowest elevation possible
  - If space and soil conditions allow, cut back unstable banks to a flatter slope, seed and replant with native, non-invasive trees and shrubs
  - Provide habitat for wildlife and aquatic species.

Env-Wt 609.05



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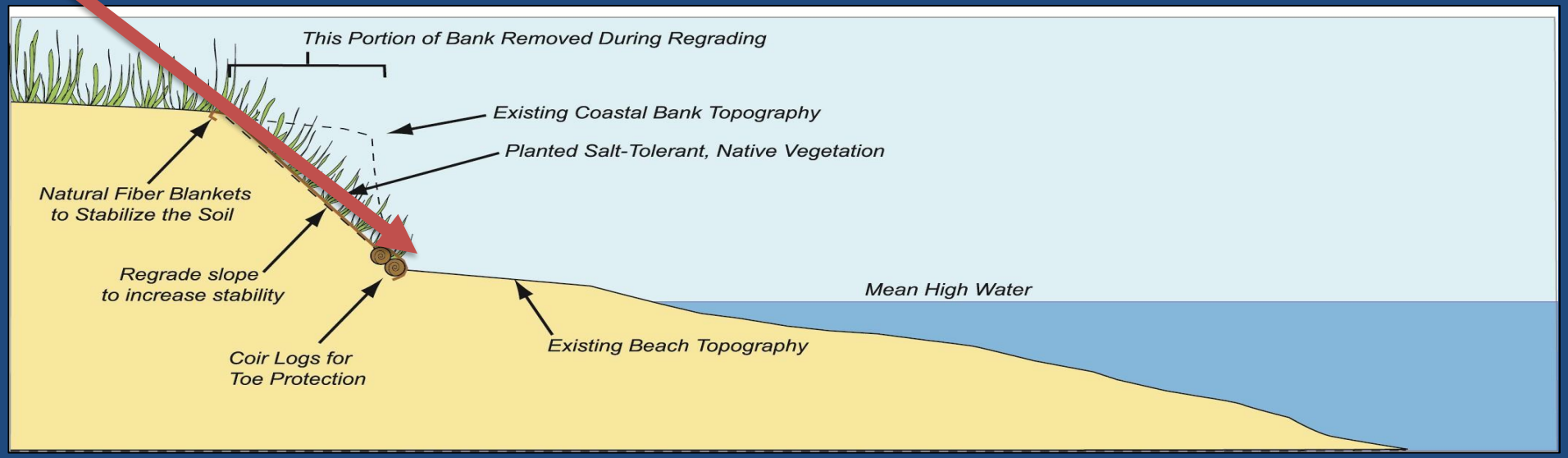

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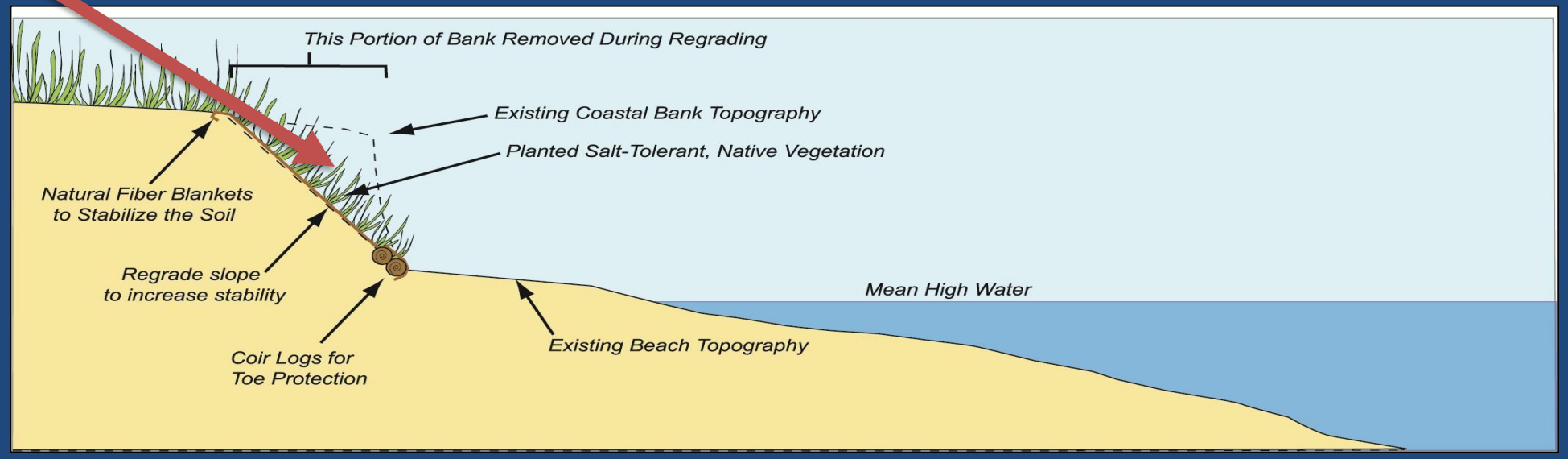

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Env-Wt 609 TIDAL SHORELINE STABILIZATION

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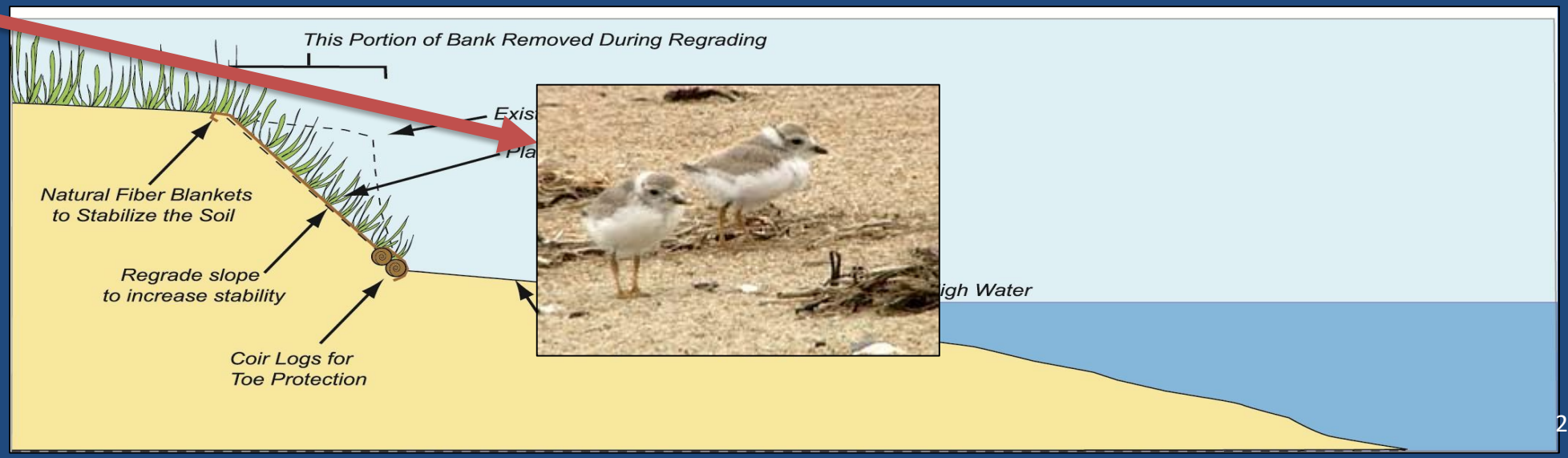
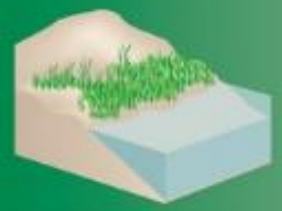


Env-Wt 609 TIDAL SHORELINE STABILIZATION

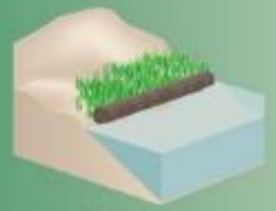
HOW GREEN OR GRAY SHOULD YOUR SHORELINE SOLUTION BE?

GREEN - SOFTER TECHNIQUES | **GRAY - HARDER TECHNIQUES**

Living Shorelines



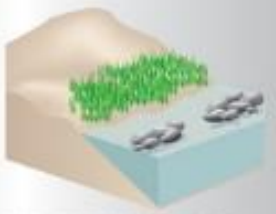
VEGETATION ONLY - Provides a buffer to upland areas and breaks small waves. Suitable only for low wave energy environments.



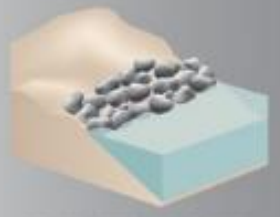
EDGING - Added structure holds the toe of existing or vegetated slope in place.

SILLS - Parallel to existing or vegetated shoreline, reduces wave energy, and prevents erosion. Suitable for most areas except high wave energy environments.

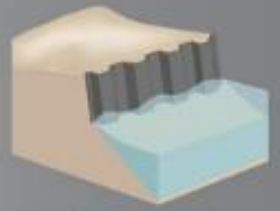
Coastal Structures



BREAKWATER - (vegetation optional) - Offshore structures intended to break waves, reducing the force of wave action, and encourage sediment accretion. Suitable for most areas.



REVETMENT - Lays over the slope of the shoreline and protects it from erosion and waves. Suitable for sites with pre-existing hardened shoreline structures.



BULKHEAD - Vertical wall parallel to the shoreline intended to hold soil in place. Suitable for areas highly vulnerable to storm surge and wave forces.

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Env-Wt 609 TIDAL SHORELINE STABILIZATION

Tidal Shoreline Stabilization Using New Hard-Scape or Rip-Rap.

- The department shall not approve any tidal shoreline stabilization plan that proposes to install new rip-rap unless:
  - The applicant demonstrates that:
    - Anticipated turbulence, flows,
    - restricted space, fetch, or similar factors render soft stabilization methods physically impractical;
    - Natural areas or naturalized soft shoreline stabilization on neighboring properties will not be affected damaged by the placement of the proposed rip-rap; or
    - The rip-rap is a component used as a sill to stabilize the toe of a living shoreline.

Env-Wt 609.07

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TIDAL SHORELINE STABILIZATION

Repair of Existing Rip-Rap.

- Existing rip-rap may be maintained in-kind, repaired in-kind, or replaced in-kind.

Env-Wt 609.08

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TIDAL SHORELINE STABILIZATION

Tidal Shoreline Stabilization Using Walls.

The department shall not approve the installation of a wall unless required to protect public infrastructure in situations where a softer stabilization technique is shown to be impracticable.

Env-Wt 609.09

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TIDAL SHORELINE STABILIZATION

Increasing erosion and inundation of coastal wetlands due to sea-level rise and storms threaten property and natural resources in New Hampshire. Historic shoreline stabilization practices of rip rap (rock walls), revetments, and seawalls can actually make erosion worse, destroy intertidal habitat, and alter sediment transport patterns. For these reasons, hard structural solutions are either the least preferred alternative or prohibited in sensitive coastal areas. In suitable areas, living shorelines present a resilient approach to shoreline stabilization that can protect people, property, and important coastal habitats.

-NH Coastal Program

TIDAL SHORELINE STABILIZATION

Questions?
eben.lewis@des.nh.gov
603-559-1515

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