
plan cumberland
Coastal Erosion Workshop

WHO ARE WE?

municipality of cumberland

UPLAND

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WHAT ARE WE DOING?

"If you don't know where you're going, you might end up someplace else"

– **Yogi Berra**

If we don't chart a course for our communities, including our coastlines, other factors will determine the future for us.

WHY DO WE PLAN?

TO SUPPORT OUR COMMUNITY'S CHARACTER & CULTURE

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WHY DO WE PLAN?

TO PREPARE FOR CHANGE

Climate change impacts will result in accelerated erosion, brought on by more frequent and more severe storms with intense wave impact and storm surge, as well as increased overland stormwater flow.

WHY DO WE PLAN?

TO PROTECT SENSITIVE ENVIRONMENTS & DEVELOPMENT

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PURPOSE TODAY

OUR WORK TOGETHER

Better understand of the scope of coastal erosion along the coast from Tignish to Malagsh – vulnerabilities in particular.

Share potential ways of managing erosion, and get feedback on the options

Collect input that will be used to develop solutions – what do you think of potential solutions?

DEFINING THE COAST

A DYNAMIC MULTI-TASKER

- The interface between land and sea
- High mixing, productivity, biodiversity and sensitivity
- Provides useful functions
- Enjoyment for people
- Living coasts are always changing

DEFINING THE COAST

AN ENVIRONMENT IN FLUX

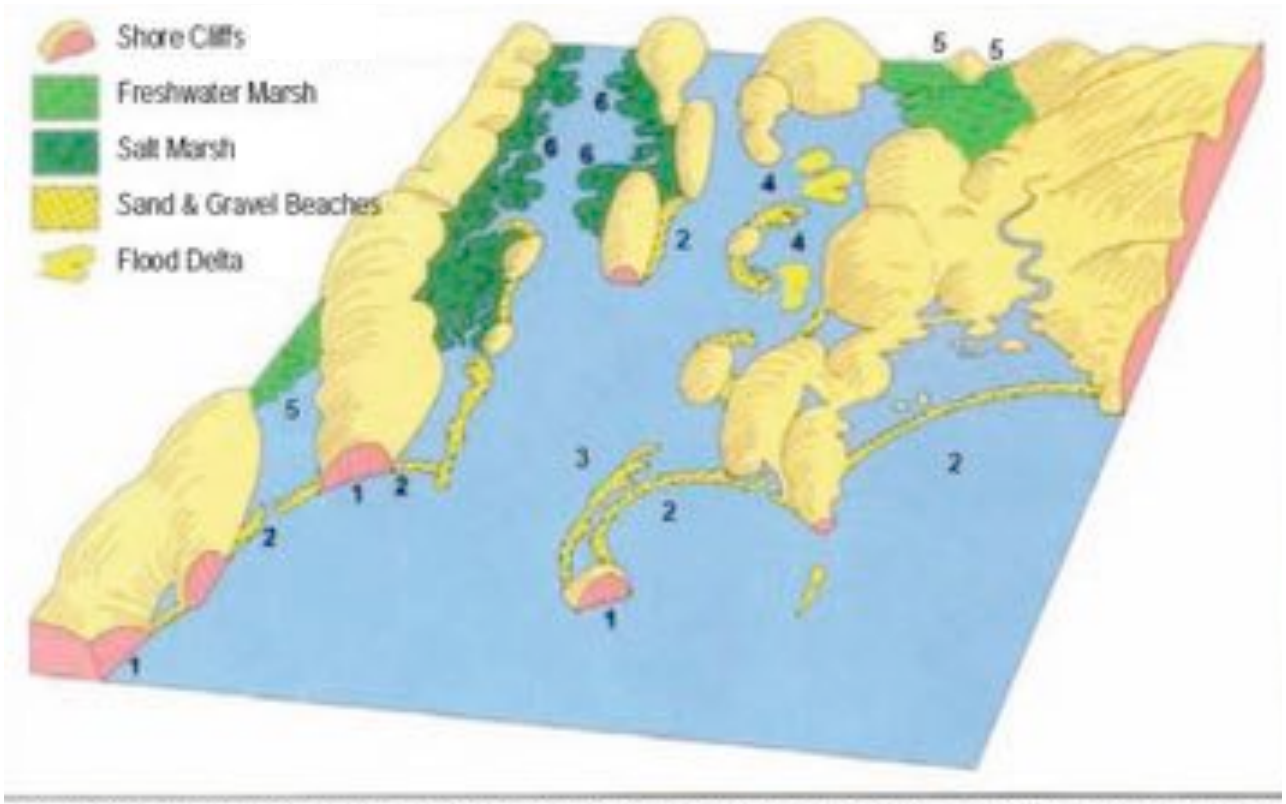

Figure 3. The role of shore cliffs in building other coastal features in Nova Scotia. Shore cliffs (1) provide the anchor and sediment source for building barrier beaches (2), spits (3), tidal flats (4), and marshes (5,6) (Natural Resources Canada 2007b).

DEFINING THE COASTAL ZONE

ITS MANY CHARACTERISTICS

- Cliff
- Sandy beach
- Rocky beach
- Dune
- Spit
- Salt marsh
- Freshwater marsh
- Road/ bridge
- Seawall/ armor rock
- Wharf/ dock
- Built structure
- Pasture
- Fishery

VULNERABILITIES

WHAT COULD BE A RISK

- Changes of different types:
  - Active and uncontrolled erosion
  - Coastal squeeze
  - Slump
  - Peninsula affect
- Roads or buildings very near coastline
- Low-lying areas
- Loss of beach sand
- Loss of beach access
- Fewer sightings of birds or aquatic species

ACTIVE EROSION

UNIMPEDED PROCESS

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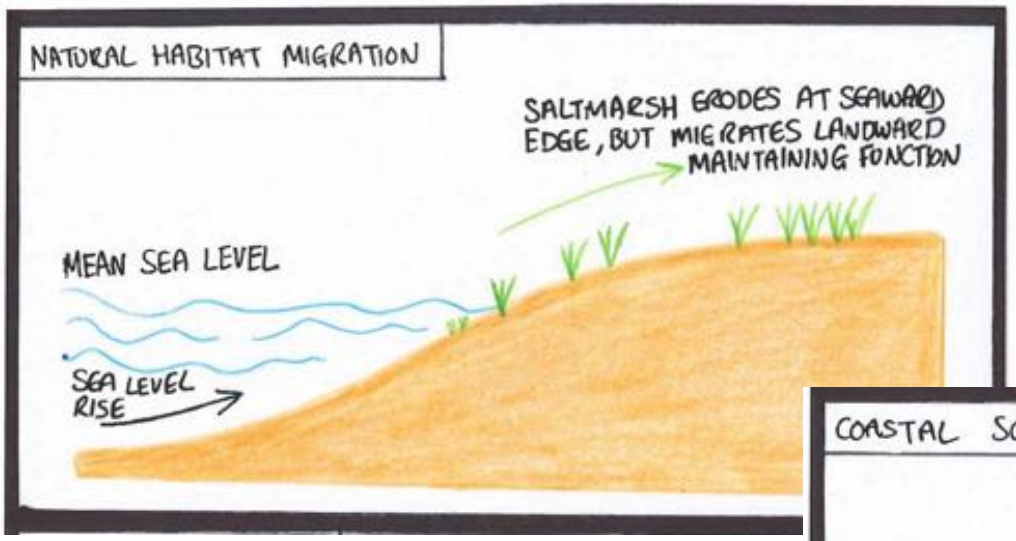
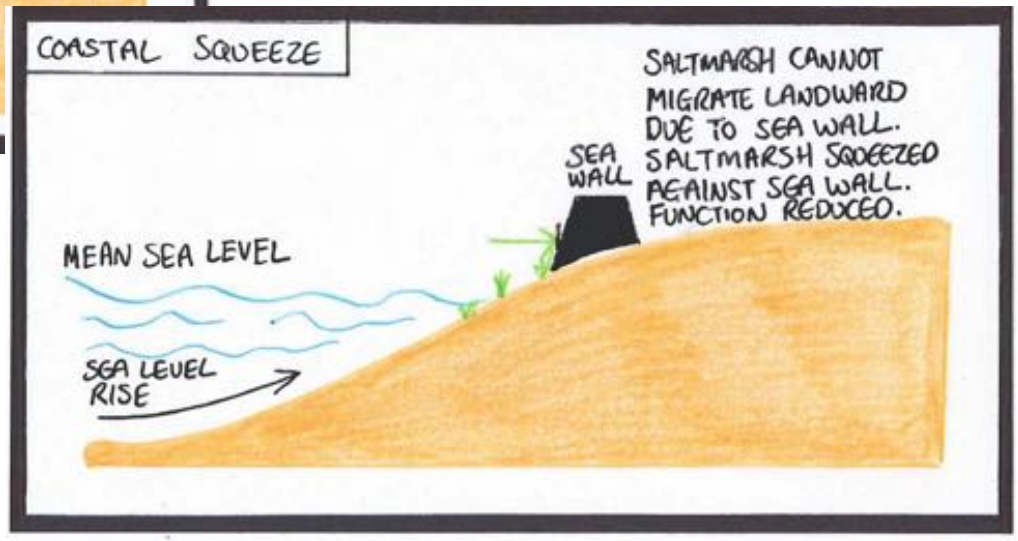
COASTAL SQUEEZE

SHRINKING BEACHES AND MARSHES





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SLUMP

LAND DROP

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PENINSULA AFFECT

ADJACENT EROSION

coastal hardening has likely increased the rate and amount of erosion on adjacent properties and prevented the coastline from eroding to become more stable.

FAILED ROCKWALL

INEFFECTIVE ARMOURING

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SOLUTIONS

WHAT TOOLS DO WE HAVE

Retreat:

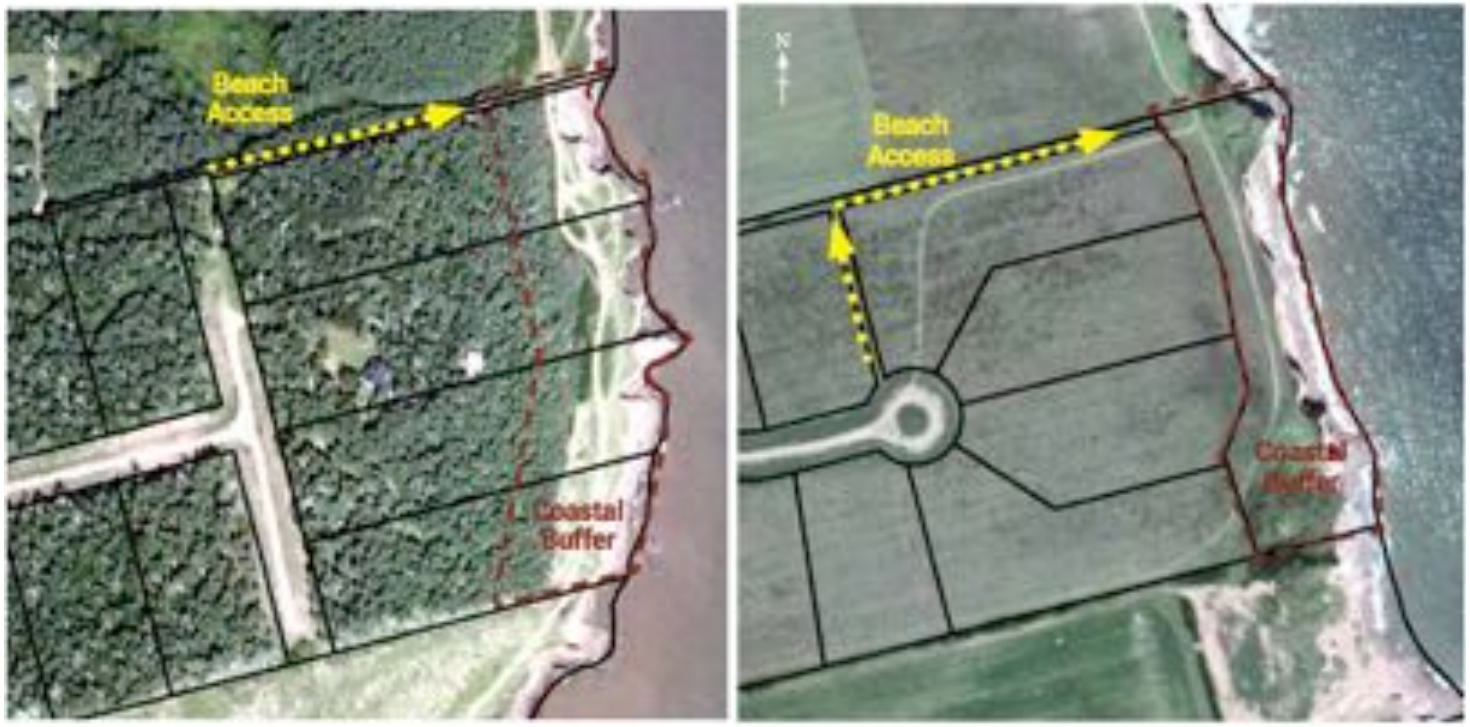
- **Buffer area**
- **Development setback**
    - **vertical and horizontal**

Stabilize:

- **Hardscaping**
- **Vegetation**

RETREAT

BUFFER AREAS

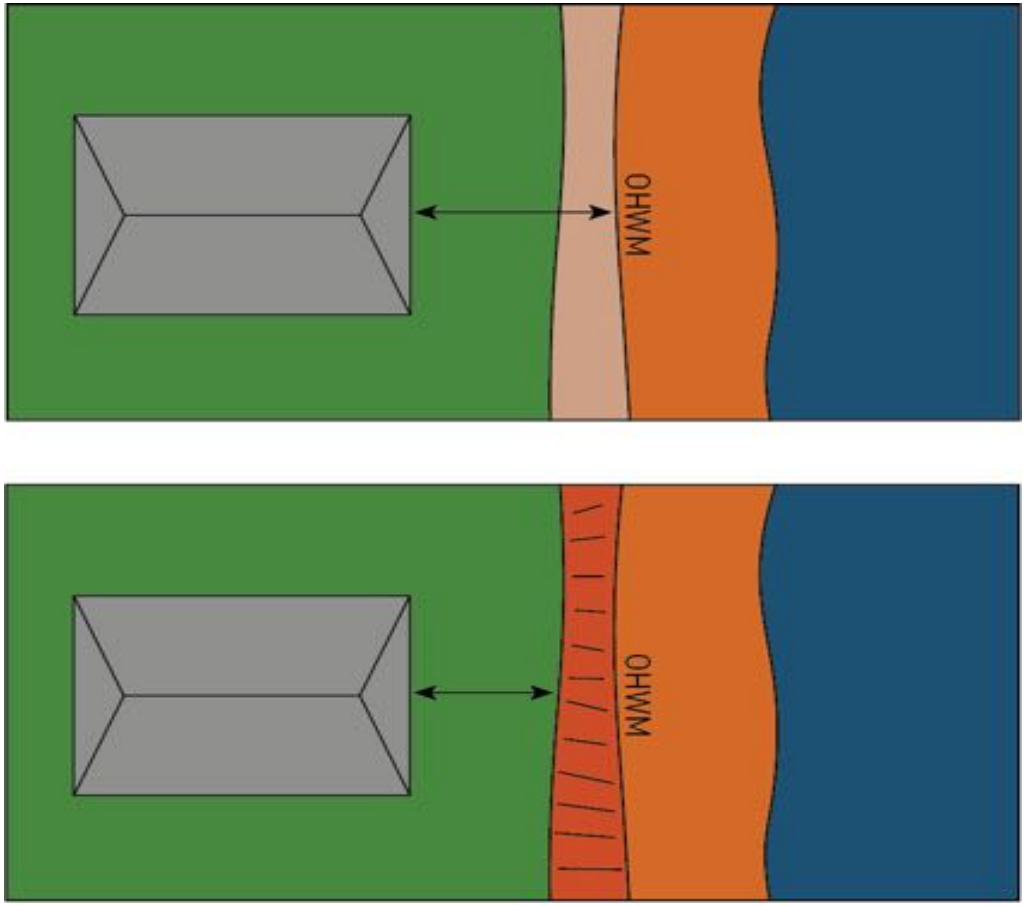


An example from the PEI Coastal Property Guide.

Can either be a component of each residential property, or it can be subdivided as a separate property that is held by a developer on in common by adjacent land owners. The right of way to the beach is also shared. The activities permitted in the buffer area are typically extremely limited, intended to reinforce the coast and mitigate erosion.

RETREAT

DEVELOPMENT SETBACK



Currently the Cumberland County policy is 100 ft from high water mark, or 100 ft from the edge of the shoreline if it is 2.5 m or more in elevation.

However there are exceptions for small lots.

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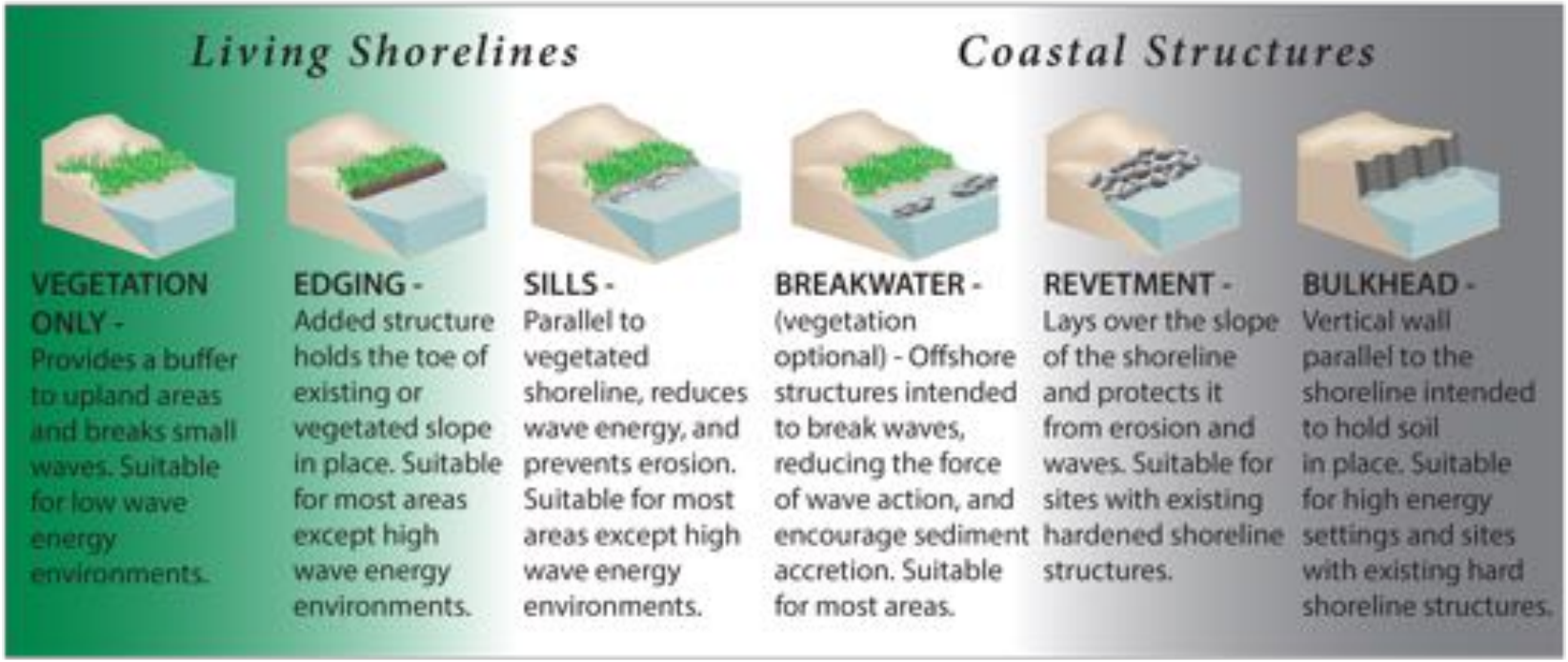
STABILIZATION

A CONTINUUM

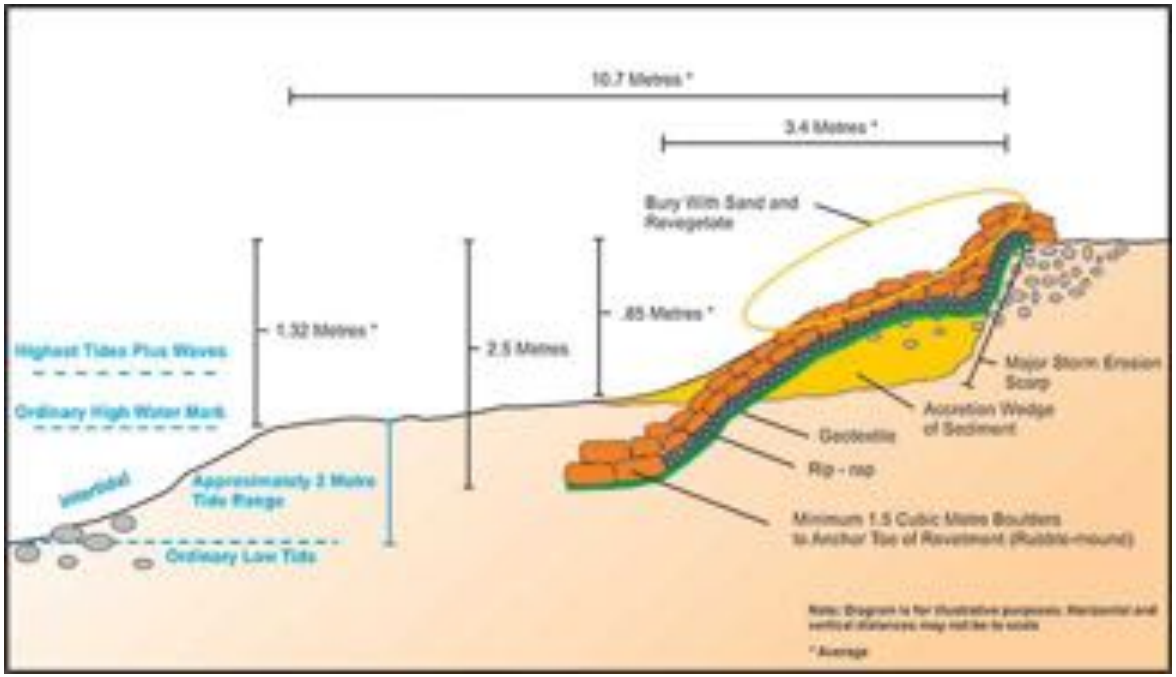
No control option can permanently stop erosion,
but various methods can slow impacts.



Soft Hard

HARD STABILIZATION

STRUCTURES



Armouring must be carefully engineered, and if constructed improperly it fails quickly. For educational purposes only - not a tool for guiding construction.

Properly installed armour rock may withstand storms for many years, and provide localized protection. It is common practice, but over time it can impact large geographic areas, by cutting off sedimentation supply or reducing habitat. It also tends to disperse energy to adjacent coastlines which do not have armour rock, in some cases accelerating the rate of localized erosion.

HARD STABILIZATION

STRUCTURES

Well placed armour rock

NATURALIZED SHORELINE

SOFT SOLUTIONS

Non-structural: grading and planting

Maintain ecosystem services

Allows coast to move and function naturally

May be less effective in high energy systems

A hybrid of hard and soft can be effective

NATURALIZED SHORELINE

QUALITIES OF A LIVING SHORELINE

Plant cover holds soil on bank, intercepts waves, wind, rain. Potential species include Lupins, Wild Roses, Spruce, Dune grass, alders (salt tolerant/extensive roots).

Replanting upland forest or meadow also minimizes issues with overland flow.

Specific options depend on shoreline conditions and energy, water depth, presence of vegetation, new or old development.

Mimic the natural processes that protect beaches, self-strengthen and endure over time.

NATURALIZED SHORELINE

GRADING AND PLANTING

Reduced slope grade decreases run off and soil loss, promotes plant establishment and fosters bank stability.

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NATURALIZED SHORELINE

COVER EXPOSED SOIL

Before

After

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NATURALIZED SHORELINE

VEGETATION BUFFER

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NATURALIZED SHORELINE

HYBRID OPTIONS

Structure used to support plant growth, and carefully placed trapezoid structures, not a jumble rock pile.

SOLUTIONS

A DISCUSSION

What are the relative pros and cons of each solution?

Do any stand out to you as having promise? How so?

How could these solutions be applied where assets are vulnerable?

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