



Visual Site Assessment

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Visual Site Assessment

- Explore the specific conditions on the property in-person
- Gather information to determine which living shoreline option to select
- The property's characteristics may make certain living shoreline options unsuitable
 - For example, submerged oyster shell beds are not recommended in high wave energy or deep water



Photo: Texas Parks and Wildlife Department



Visual Site Assessment Components

WATER

Wave energy

Fetch

Water depth

Salinity

SHORE

Shoreline type

Slope

Erosion Rate

OTHER

Neighboring property conditions

Personal preference

Utilize this site assessment worksheet to better understand the conditions on your property that may affect the success of a selected living shoreline and also to assist you to better identify preferences for your living shoreline design.

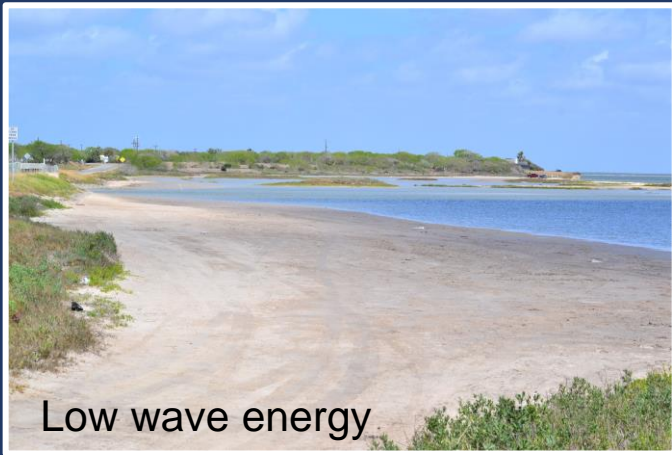
1. Type of Shoreline: Natural, Armored, Marsh, Beach, Flat or other
Comments: _____
2. Slope: No Slope, Gradual Slope, or Steep Slope, Bluff
Comments: _____
3. Erosion Rate: No Erosion, Low Erosion, Moderate Erosion, or High Erosion
Comments: _____
4. Wave Energy: Low Energy, Moderate Energy, or High Wave Energy
Comments: _____
5. Fetch: Short fetch; Moderate fetch, or Long fetch
Comments: _____
6. Water Depth Immediately Off-Shore: Shallow, Moderate Depth or Deep
Comments: _____
7. Salinity: Saline, Brackish or Freshwater
Comments: _____
8. Neighboring Property Conditions
 - a. What are the conditions on neighboring property's shorelines?
 - b. Do they have a bulkhead or seawall or a more nature shoreline?
 - c. Are they experiencing erosion? How severe?
 - d. Are they interested in using a living shoreline to prevent erosion?Comments: _____
9. Do You Have a Personal Preference for Living Shoreline Features? For example, do you want the living shoreline to increase biodiversity, provide fish habitat, provide water access, reduce erosion, improve water quality, or look natural?
If so, what? _____
10. Do You Have a Recreational Structure such as a Pier, Dock, or Boat Ramp to Consider When Selecting a Living Shoreline?
If so, what? _____

Wave Energy

Wave energy is a strong erosional force caused by natural forces or human activity

Questions to help determine the wave energy at a site:

- Is the property sheltered or far from boat traffic? Is it a mud or tidal flat? **LOW**
- Is there shell hash on the shore? **MODERATE**
- Does the property border a shipping channel or have steep bluffs? **HIGH**



Low wave energy



Moderate wave energy



High wave energy

Photos: GLO



Type of Shoreline

The type of shoreline on the property will help determine which living shoreline option is the most practical

Questions to help determine the shoreline type:

- Is the shoreline a marsh, beach, tidal flat, or mud flat?
- Is the shoreline sand or fragmented shells?
- Does the shoreline have a hard stabilization structure in place? For example, is there a bulkhead?



Mud flat shoreline



Slope

The grade or steepness of the shoreline

Flat or gradual sloping shorelines are best for marsh plantings, while steeper slopes might require a rock alternative

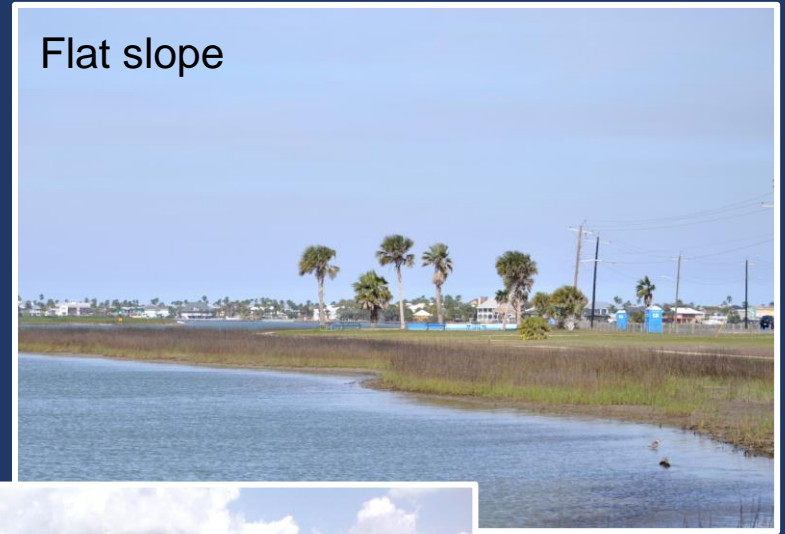
Grading to flatten the land and prepare it for installation might be necessary

Slope types:

- Flat
- Gradual
- Moderate
- Steep

Photos: GLO

Flat slope



Moderate slope with Spartina



Steep sloped bluff



Salinity

Freshwater mixing with saltwater produces a range of salinity

The salinity determines which vegetation will grow best and whether oysters will be a successful part of the living shoreline design

Salinity options:

- Saltwater
- Freshwater
- Brackish



Photo: Galveston Bay Foundation

Visual Site Assessment

Living shoreline option based on property's characteristics

Category	Option	Shoreline Type			Wave Energy			Water Depth		
		Existing Bulkhead	Marsh	Beach Sand / Shell Hash	Low	Moderate	High	Shallow	Moderate	Deep
Soft Stabilization	Marsh Vegetation Plantings	X	✓	•	✓	•	X	✓	•	X
	Coir Logs	X	✓	✓	✓	X	X	✓	X	X
Hybrid Stabilization	Submerged Oyster Shell Beds	•	✓	✓	✓	✓	X	✓	•	X
	Reef Balls	•	✓	✓	✓	✓	✓	✓	✓	X
	Articulated Mats or Blocks	X	✓	✓	✓	✓	•	✓	•	X
	Breakwater with Marsh Plantings	✓	✓	•	•	✓	✓	✓	✓	✓
	Riprap with Marsh Plantings	✓	✓	•	•	•	X	✓	•	X

✓	Best management strategy
•	Potential management strategy
X	Generally not recommended



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	Coir Logs	X	✓	✓	✓	X	X	✓	X	X
Hybrid Stabilization	Submerged Oyster Shell Beds	•	✓	✓	✓	✓	X	✓	•	X
	Reef Balls	•	✓	✓	✓	✓	✓	✓	✓	X
	Articulated Mats or Blocks	X	✓	✓	✓	✓	•	✓	•	X
	Breakwater with Marsh Plantings	✓	✓	•	•	✓	✓	✓	✓	✓
	Riprap with Marsh Plantings	✓	✓	•	•	•	X	✓	•	X

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Living shoreline option based on property's characteristics

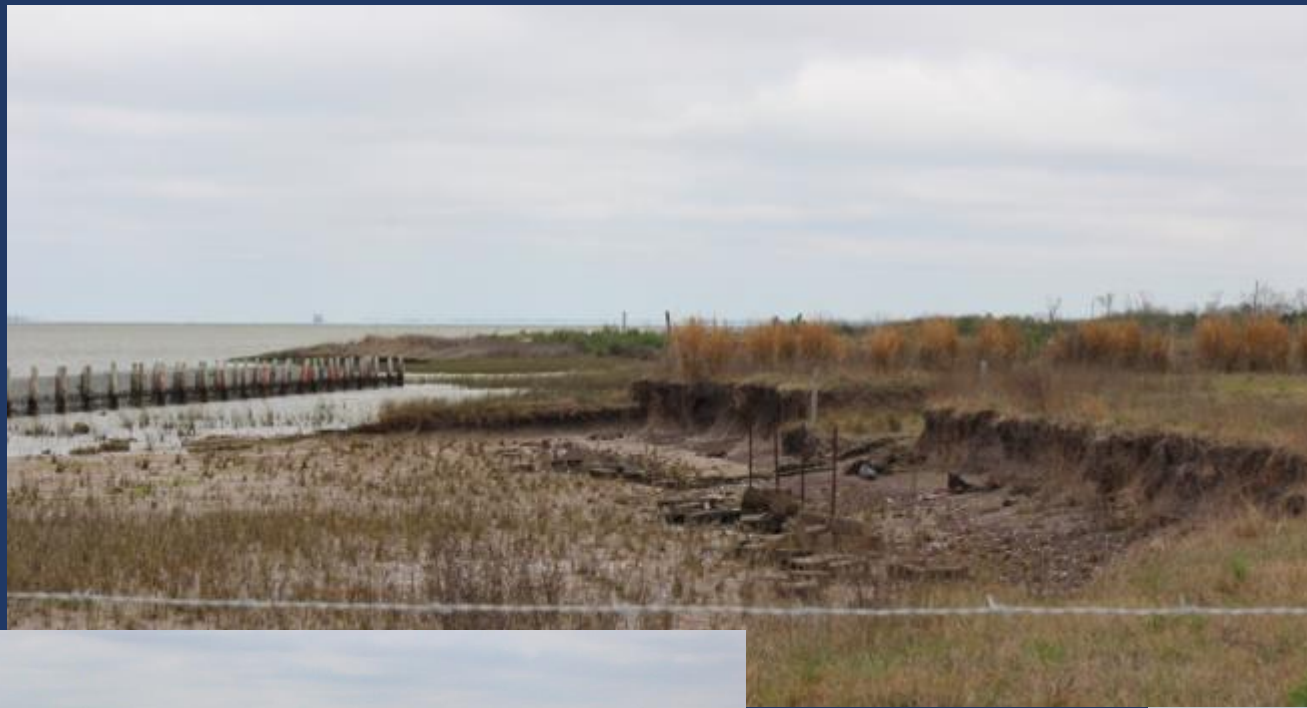
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Hybrid Stabilization	Submerged Oyster Shell Beds	•	✓	✓	✓	✓	X	✓	•	X
	Reef Balls	•	✓	✓	✓	✓	✓	✓	✓	X
	Articulated Mats or Blocks	X	✓	✓	✓	✓	•	✓	•	X
	Breakwater with Marsh Plantings	✓	✓	•	•	✓	✓	✓	✓	✓
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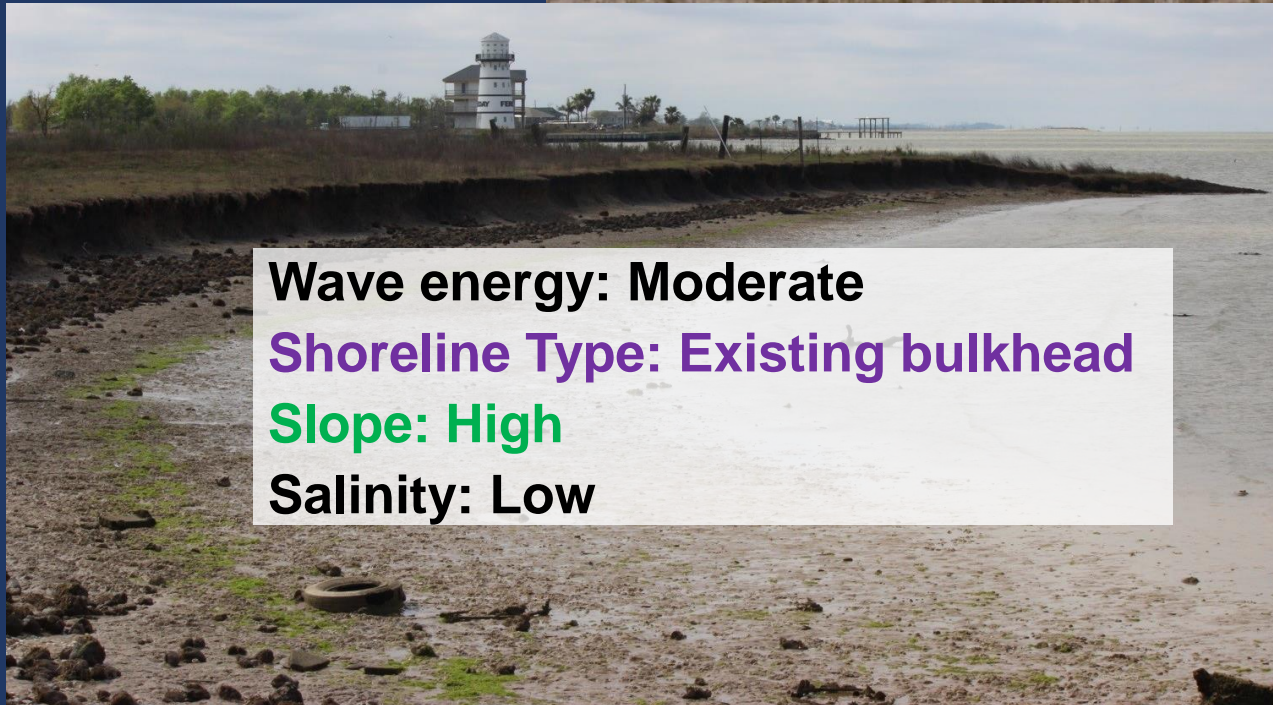
Oak Island

Property Owner



Oak Island

Property Owner



Oak Island

Living Shoreline Installed:

- Rock breakwater with marsh vegetation planting



Photos: Galveston Bay Foundation

Texas General Land Office
George P. Bush, Commissioner



Living Shoreline Options

The GLO has identified four broad categories of living shorelines commonly used along the Texas coast

Soft Stabilization



Retrofit: Hybrid Stabilization

Hybrid Stabilization



Retrofit: Soft Stabilization

Photos: GLO

Texas General Land Office
George P. Bush, Commissioner



Soft Stabilization

- Non-structural in nature and usually involve planting marsh grasses along the existing shoreline
- Marsh grass plantings
 - Root systems hold soil in place to help reduce erosion
 - Plant shoots reduce wave energy and increase sediment deposition
- Coir logs
 - Most effective in low energy environments above the mean high tide line



Photo: GLO



Photo: GLO



Photo: Delaware Living Shorelines

Hybrid Stabilization

Incorporate the materials used in soft techniques with hard features to provide additional erosion protection

Options:

- Submerged Oyster Shell Beds
- Reef Balls
- Articulated Blocks or Mats with Marsh Plantings
- Riprap with Marsh Plantings
- Breakwater with Marsh Plantings



Photo: Mott MacDonald



Photo: GLO



Photo: Triton Environmental Solutions, LLC



Retrofit: Soft Stabilization

- Used in lower energy environments that already have a hard structure in place such as a bulkhead or seawall
- For environments that can support marsh vegetation without any additional offshore structure to protect the plants
- Vegetation is planted seaward of the existing hard structure



Photo: GLO



Retrofit: Hybrid Stabilization

- Used when there is an existing shoreline structure in place such as a bulkhead or seawall
- There may or may not be existing marsh plantings that need additional protection from an oyster reef, articulated blocks or mat, breakwater, or riprap.
- The living shoreline is installed seaward of the existing hard structure



Photo: Galveston Bay Foundation



Photo: GLO



Photo: GLO

Out of the 114 known living shoreline projects in Texas, there are...

