

Living Shoreline Site Suitability Model

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Model's goal is to use geospatial data to identify :

- What areas are suitable for a living shoreline?
- If suitable, what kind of shoreline technique?



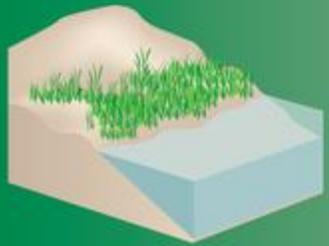
Input	Output
<ul style="list-style-type: none">• Shoreline type• Water depth• Nearshore slope• Erosion rate• Exposure to wind and waves• Distance to nearest channel	<ul style="list-style-type: none">• Soft stabilization• Hybrid stabilization• Retrofit: Soft• Retrofit: Hybrid• Not suitable

HOW GREEN OR GRAY SHOULD YOUR SHORELINE SOLUTION BE?

GREEN - SOFTER TECHNIQUES

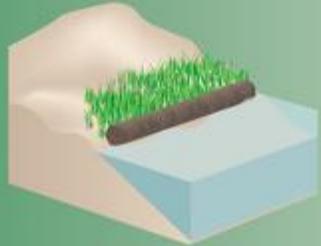
GRAY - HARDER TECHNIQUES

Living Shorelines



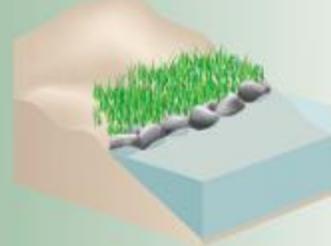
VEGETATION ONLY -

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



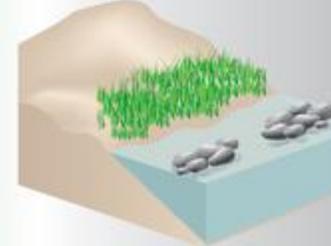
EDGING -

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



SILLS -

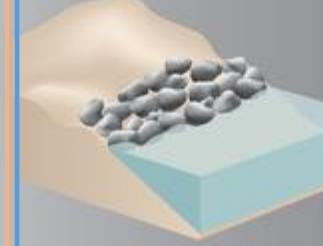
Parallel to existing or vegetated shoreline, reduces wave energy, and prevents erosion. Suitable for most areas except high wave energy environments.



BREAKWATER -

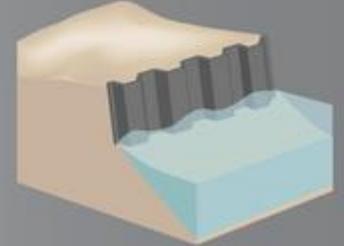
(vegetation optional) - Offshore structures intended to break waves, reducing the force of wave action, and encourage sediment accretion. Suitable for most areas.

Coastal Structures



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.

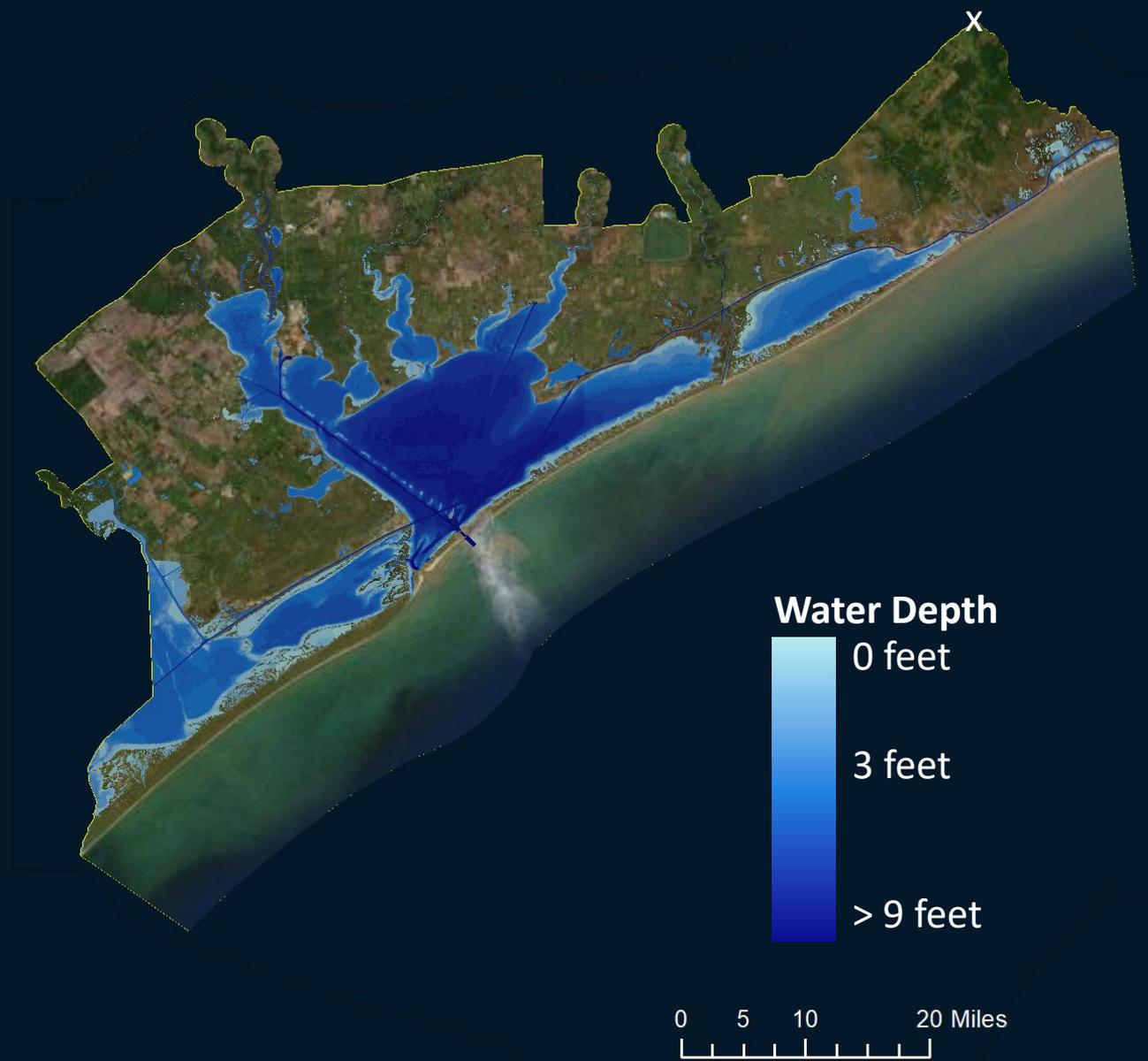
Soft Stabilization

Hybrid Stabilization

Retrofit

Model Input Data

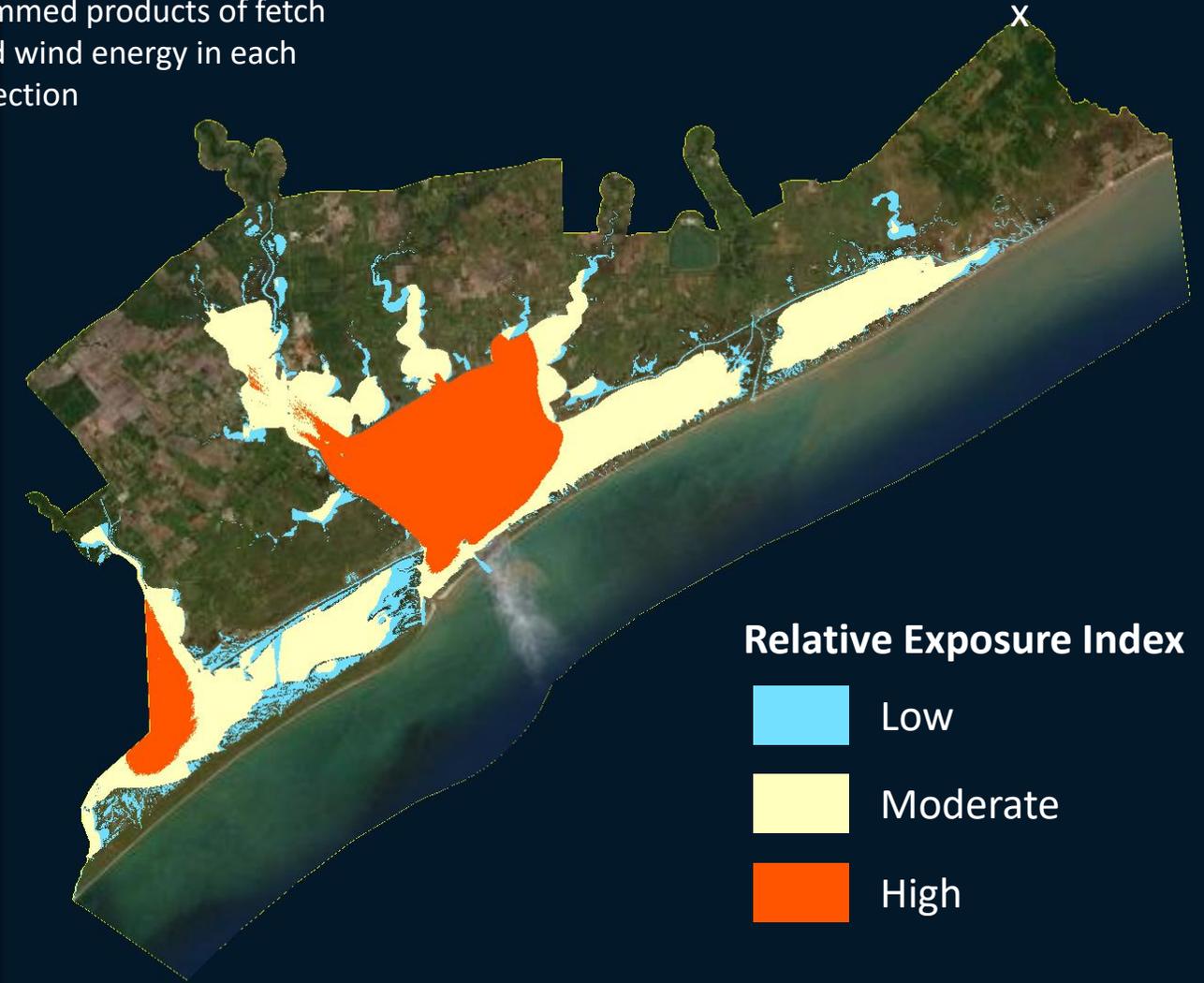
Factor	Data Source	Range
Bathymetry	USACE	Shallow Deep
Relative Exposure Index	NOAA Wind gauges; USGS Fetch Model	Low Moderate High
Shoreline Type	HRI mapped Environmental Sensitivity Index	Beach or Marsh Present Scarp Present Armoring Present
Shoreline Change Rate	BEG Historic Shorelines	Stable to Accretion Low Moderate High
Proximity to Channel	HRI Channel Polygon	Large or small channel? Border Near Far



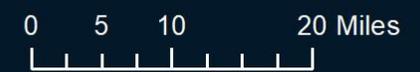
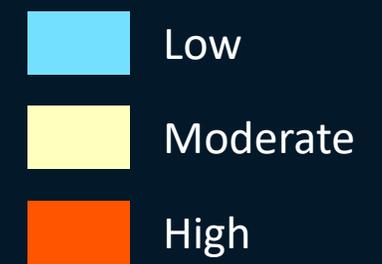
Model Input Data

Factor	Data Source	Range
Bathymetry	ADCIRC Mesh	Shallow Deep
Relative Exposure Index	NOAA Wind gauges; USGS Fetch Model	Low Moderate High
Shoreline Type	HRI mapped Environmental Sensitivity Index	Beach or Marsh Present Scarp Present Armoring Present
Shoreline Change Rate	BEG Historic Shorelines	Stable to Accretion Low Moderate High
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- 10 years of wind data
- Calculated average wind speed every 22.5 degrees
- Summed products of fetch and wind energy in each direction



Relative Exposure Index



Model Input Data

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Shoreline Type

- Beach or Marsh
- Existing Structure



Model Input Data

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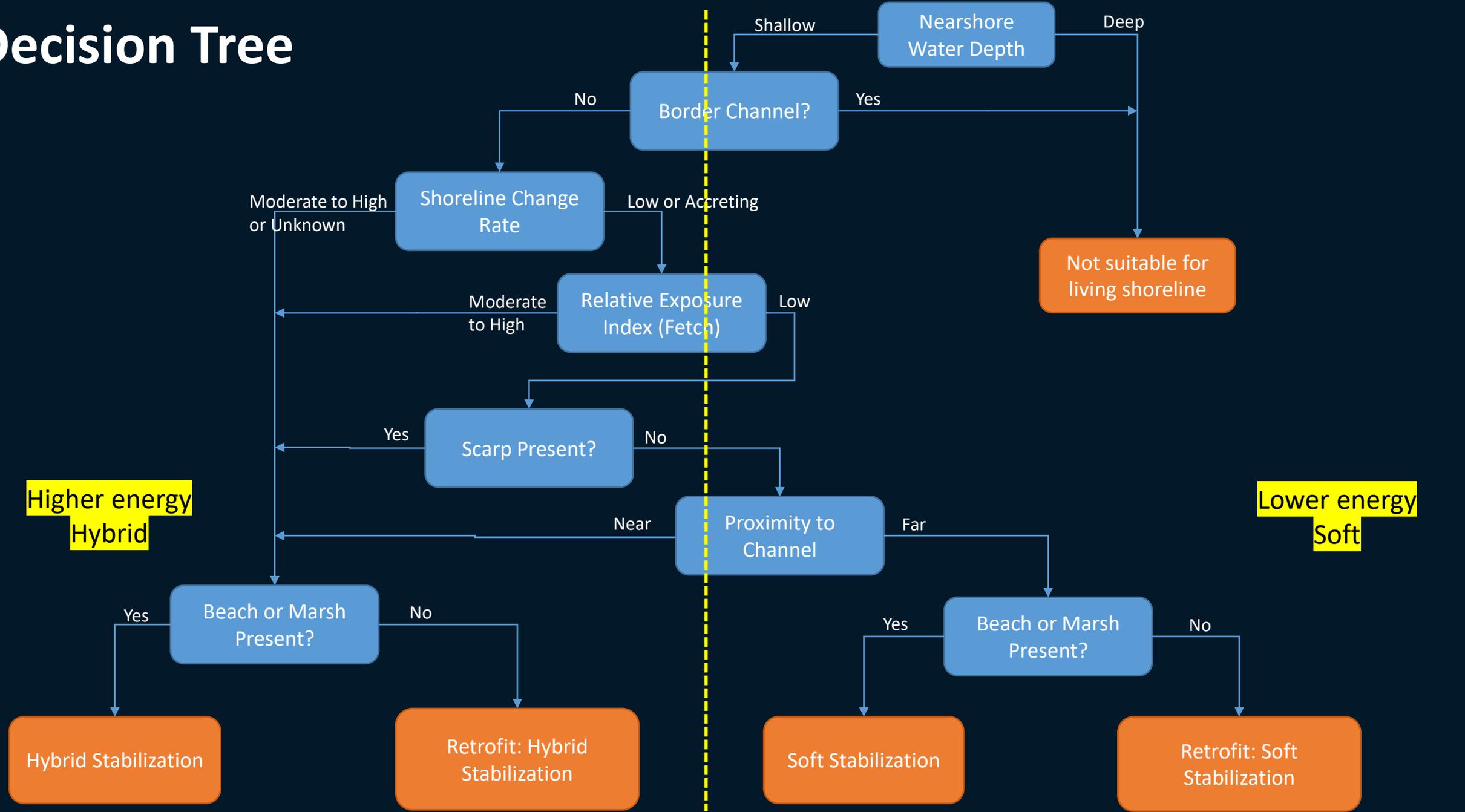


Model Input Data

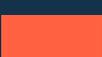
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Decision Tree



Site Suitability Output

Map Symbol	LS Technique	Percent of Shoreline
	Soft Stabilization	43%
	Hybrid Stabilization	40%
	Retrofit: Soft Stabilization	2%
	Retrofit: Hybrid Stabilization	5%
	Not Suitable	10%



[Link to Tool](#)

Summary

- Living Shoreline Site Suitability Model developed to indicate potential for different shoreline stabilization techniques
 - Only recommendations based on available data – not the absolute answer to what technique should be used
 - Other factors should be considered
- Model output and related information for the entire Texas coast will be available online for public access
- Please contact HRI if you have any questions – Marissa.Dotson@tamucc.edu