Living Shoreline Demonstration Project
Recent Experience on Design and Construction

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Eloi Point

TREASURE BAY

Bayou la Loutre

ELOI BAY

Paulina Point

Lydia Point

Project Location
Artificial Oyster Reef Candidates

- Reefball
- HESCO
- Oysterbreak
- Ecodisks
- Biohaven Floating Island
- WADs
- Marine Mattress
- Aja
Performance:

- Reduce Marsh Erosion (reduce wave transmission)
- Provide substrate for oyster growth (oyster area)

Design:

- Geotechnically Stable (bearing pressure)
- Hydrodynamically Stable (Cat 1 Hurricane)
- Cost-effective
Design Condition

\[ R \sim \alpha (\text{Wave Power})^{\beta} \]
Design Condition

Top of Marsh Edge
Mean Sea Level
Instantaneous Sea Level
Toe of Marsh Edge

\[ R \sim \alpha (\text{Wave Power}) \]

\[ \beta \]

\[ d \quad h \quad D \]

\[ \alpha \]
Design Condition

Top of Marsh Edge
Mean Sea Level
Instantaneous Sea Level
Toe of Marsh Edge

R ~ α(Wave Power) β
Design Condition

- Top of Marsh Edge
- Mean Sea Level
- Instantaneous Sea Level
- Toe of Marsh Edge

\[ R \sim \alpha (\text{Wave Power}) \]
Design Condition

Top of Marsh Edge
Mean Sea Level
Instantaneous Sea Level
Toe of Marsh Edge

\[ R \sim \alpha (\text{Wave Power}) \]

\[ \beta \]
Wave Transmission Performance

- Wave transmission $K_t$ is wave energy passing over or through structure
- Empirical methods focused on rock breakwaters
- Need empirical (or similar) method to compute for unique living shoreline products → use CFD model
Wave Transmission Modeling

Rubblemound

Time Frame: 2.00296
Wave Transmission Modeling
Wave Transmission Modeling
Wave Transmission Performance

Transmission for all products

![Graph showing transmission coefficients for different alternatives and a rule of thumb.](image-url)
Design Considerations

Layout

- Need continuous protection for erosion control
- Must follow contour to retain appropriate height for performance
- Max slope ~ 10H:1V for stability
- Baseline curve / turns
  - Must work with unit geometry
  - Tight turns may reduce transmission performance
  - Must be constructible
- Breakwater max 1000 ft for habitat access; some units limited by return flow
Project Layout
Project Layout
Project Layout – Alignment along Contour
Project Layout – Alignment along Contour

For Construction
Unit Manufacturing

- Time to manufacture and cure
- Quantity produced vs installed
- QC review
Bottom treatment and clearing (none)
Baseline Alignment
Baseline Alignment and realignment
Questions?