



# Long-Term Resiliency-Building Alternatives for Haigis Beach

Public Meeting #1

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TOWN OF  
**DENNIS**  
MASSACHUSETTS

# Public Meeting Agenda

## 1) Introductions – Town, Woods Hole Group, EDR

## 2) Project Background

- The need for the current project
- Proactive management
  - Emergency repairs & stairs

## 3) Review Scope of Services

## 4) Key Considerations / Concerns

- Town & Neighbors

## 5) Future Vision for the Site

- Town & Neighbors

## 6) Adjourn

**Meeting Goals:** *Review the project goals, objectives, and scope of work. Leverage local knowledge of the site and begin discussing a vision for the future.*



Damage to Haigis Beach rock revetment following sou'easter storm events.

# Project Background

## Current Risks

- Wave impacts have damaged the rock revetment, forming voids and creating a public safety hazard.
- Waves overtopping the rock revetment have led to undermining and slumping of sand located along the crest.
- Without substantial maintenance, the sloping rock revetment is reaching the end of its serviceable lifespan.
- ***Risk of repetitive loss.***

## Proactive Management & Planning to Address Impacts

- Emergency repairs to the structure.
- Emergency permitting & beach access stairs.
- ***Long-term planning to improve resilience.***



2024 Winter Storm Impacts



Emergency Repairs

# Scope of Work

- **Review Existing Datasets**
- **Resource Area Delineation, Site Survey, Plans**
- **Coastal Processes**
  - Shoreline Change
  - Water Levels
  - Waves & Sediments
- **Conceptual Alternative Development**
- **Evaluation & Reporting**
- **Public Education & Outreach**
  - Social Media Posts & Meetings

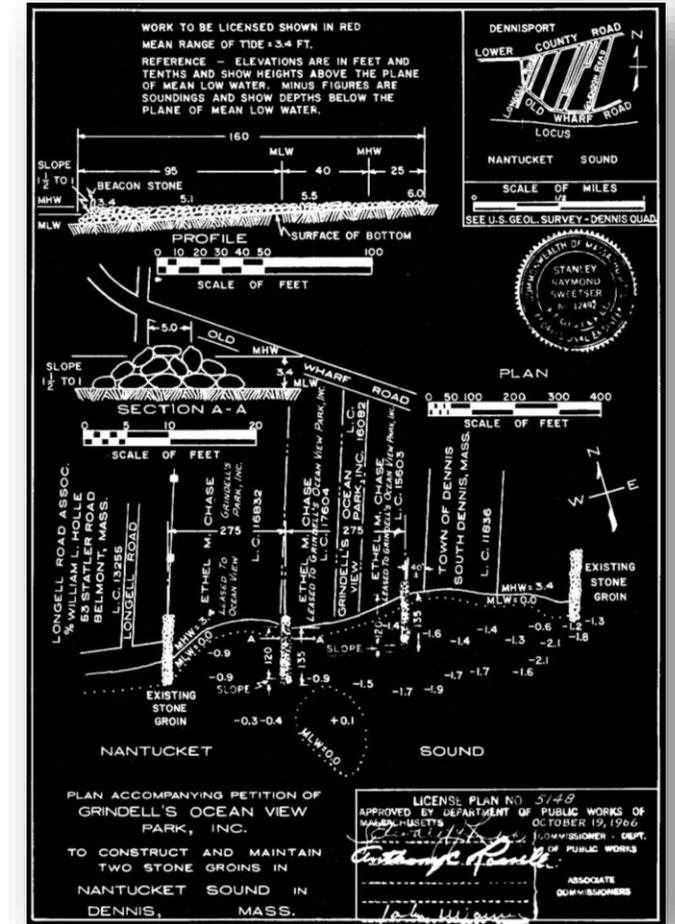
**Goals & Objectives:** *Focus on improving resilience to coastal storms, public safety, and maintaining access to the shore*



# Review of Existing Datasets

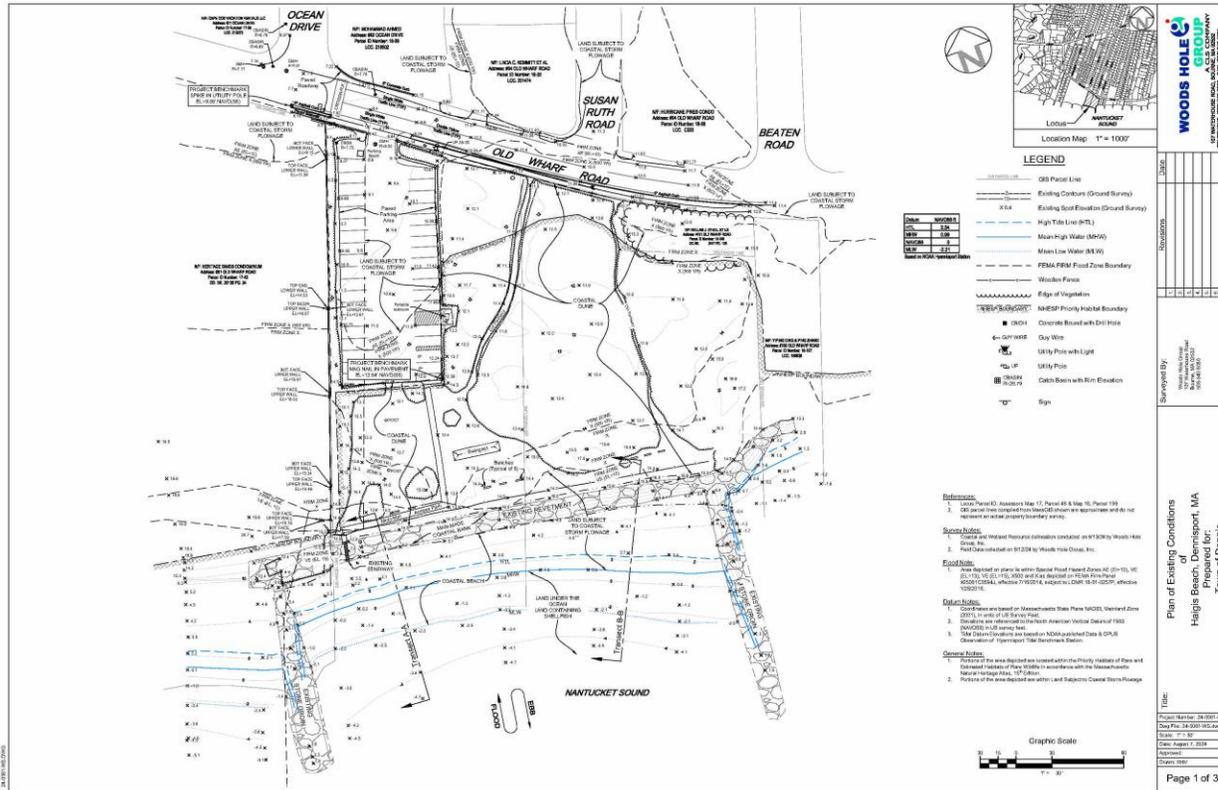
- Parcel ownership
- Engineering structures & permits
- Env. Justice Communities
- Land use history
- Revenues
- Public use

## Project Location



# Delineation, Survey, Existing Conditions Plans

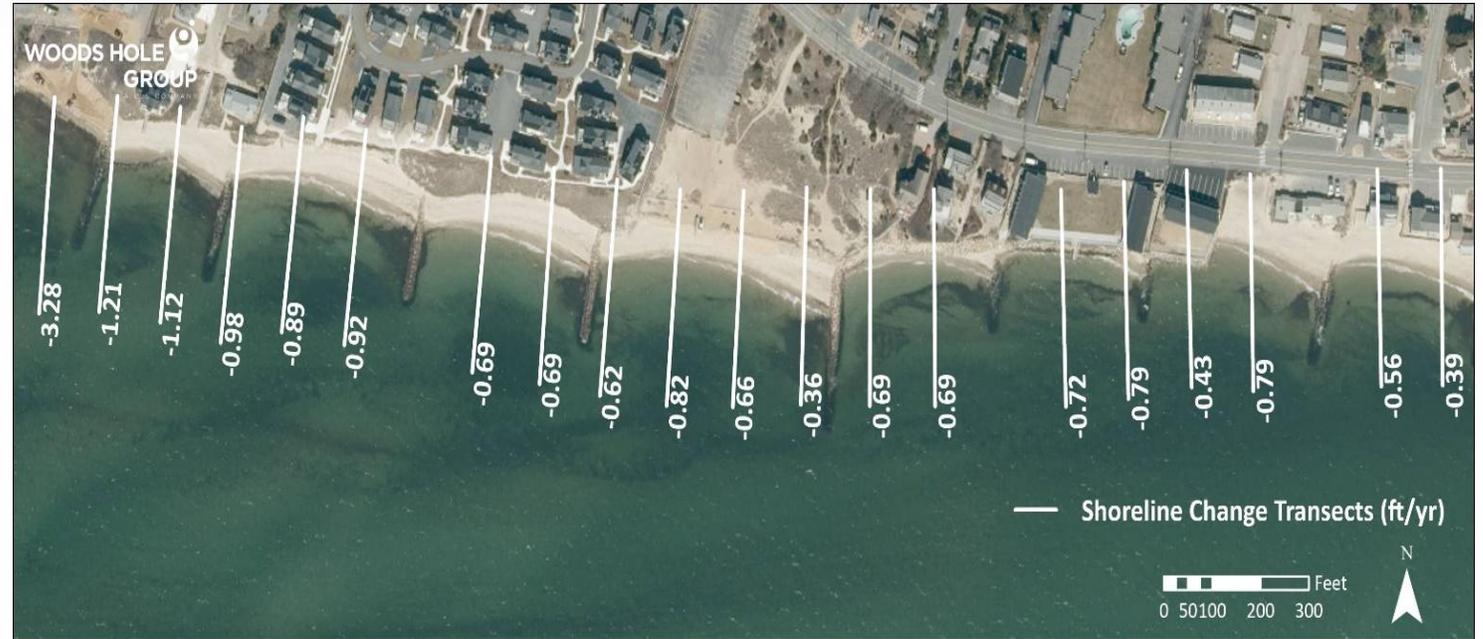
- Necessary 1<sup>st</sup> step in the process
- Coastal dune and coastal beach resource areas
- Surveyed topography, parcels, and Town assets



# Coastal Processes Analysis – Shoreline Change



Historical shoreline positions along Haigis Beach.

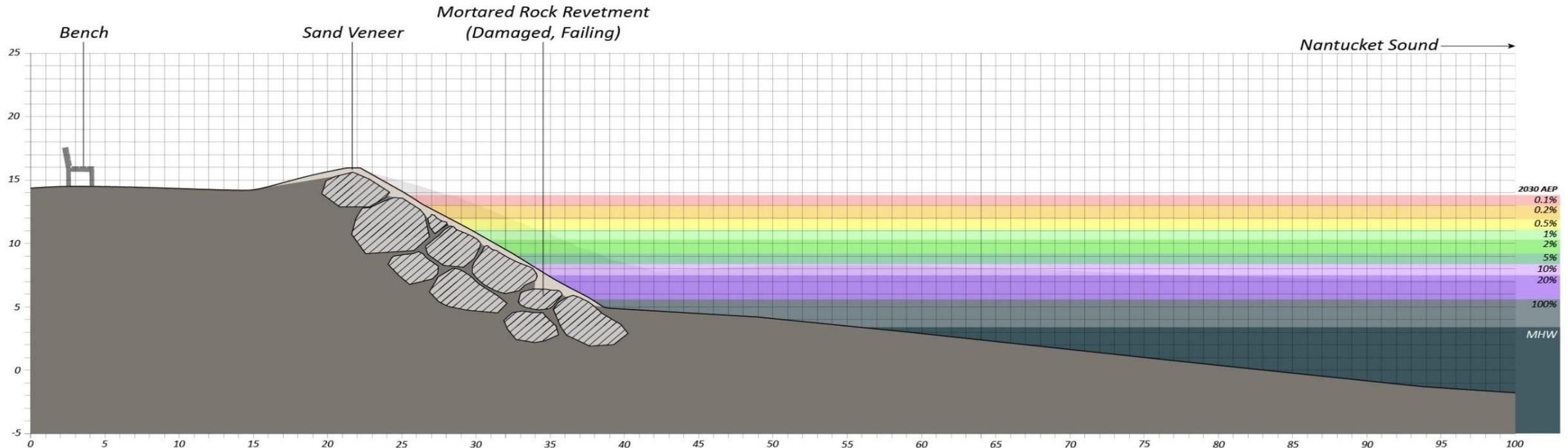


Long-term transects (1938-2023).

- Haigis Beach shoreline is largely erosional (-0.62 ft. / yr.)
- Coastal engineering structures dampen rate of change
- Structures disrupt natural coastal processes – erosion, sed. tx., etc.
  - Less sand erodes in the winter to rebuild beach in the summer
  - Over time, less high tide beach available for recreation

# Coastal Processes Analysis – MC-FRM (2030)

- Massachusetts Coast Flood Risk Model – State standard for infrastructure planning
- Illustrate how high tide and coastal storm surge elevations are expected to change over time
- Excellent point of reference for coastal planning and design

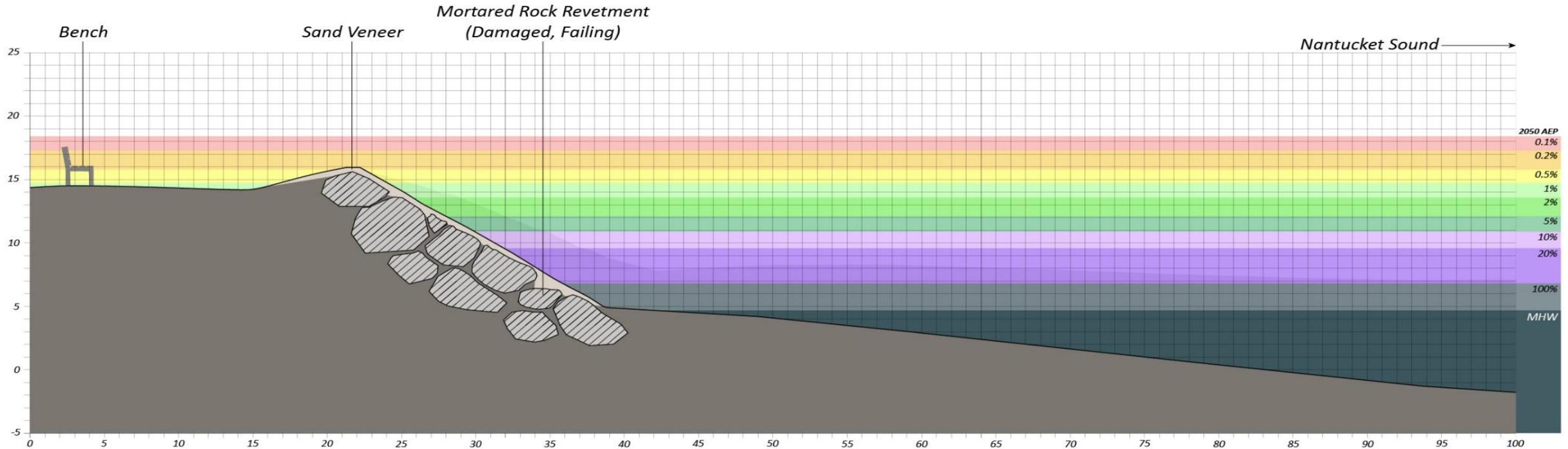


**EXISTING CONDITIONS - 2030 MC-FRM WATER SURFACE ELEVATIONS**

Haigis Beach, Dennis

# Coastal Processes Analysis – MC-FRM (2050)

- Rising tides and storm water levels through 2030, 2050, 2070 planning horizons.

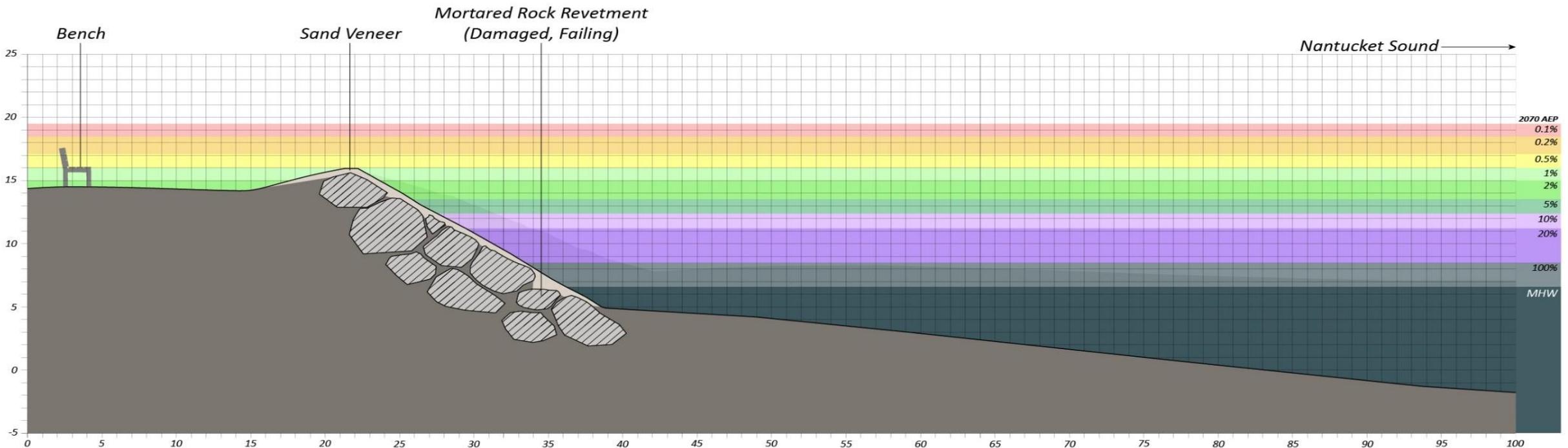


**EXISTING CONDITIONS - 2050 MC-FRM WATER SURFACE ELEVATIONS**

Haigis Beach, Dennis

# Coastal Processes Analysis – MC-FRM (2070)

- Over the 2030-2070 planning horizon, water surface elevations associated with high-intensity storm events will begin to overtop the existing rock revetment.
- Over the 2030-2070 planning horizon, water surface elevations associated with high tide and low-intensity storms (annual nor'easter, or similar) will inundate the bottom half of the existing rock revetment.



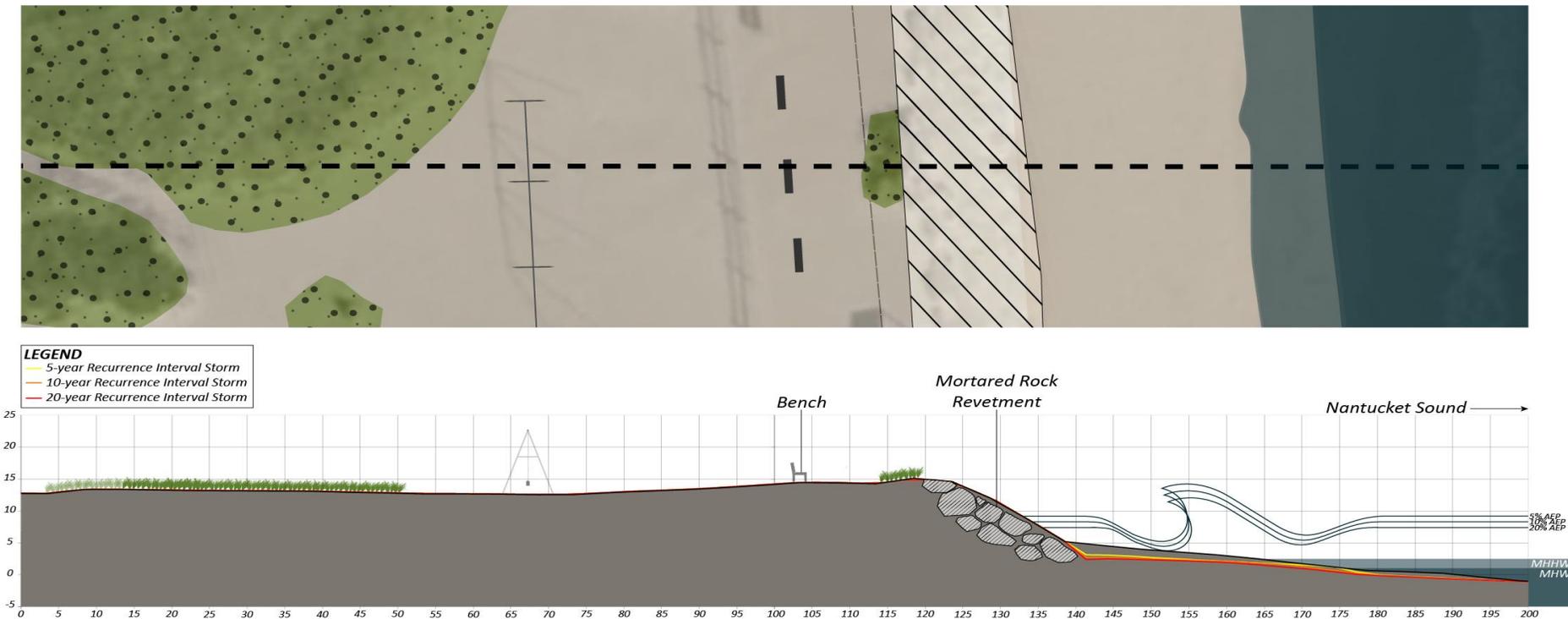
**EXISTING CONDITIONS - 2070 MC-FRM WATER SURFACE ELEVATIONS**

Haigis Beach, Dennis

# Coastal Processes Analysis – Sediment Transport

## 5-, 10-, 20-year storm cases w/ Revetment (2030)

- Cross-shore modeling illustrates how the shoreline erodes during a storm and how sand is redistributed.
- With the revetment in place, results show very little erosion landward of the revetment through 2070.
- Scour along the toe of the revetment is expected.



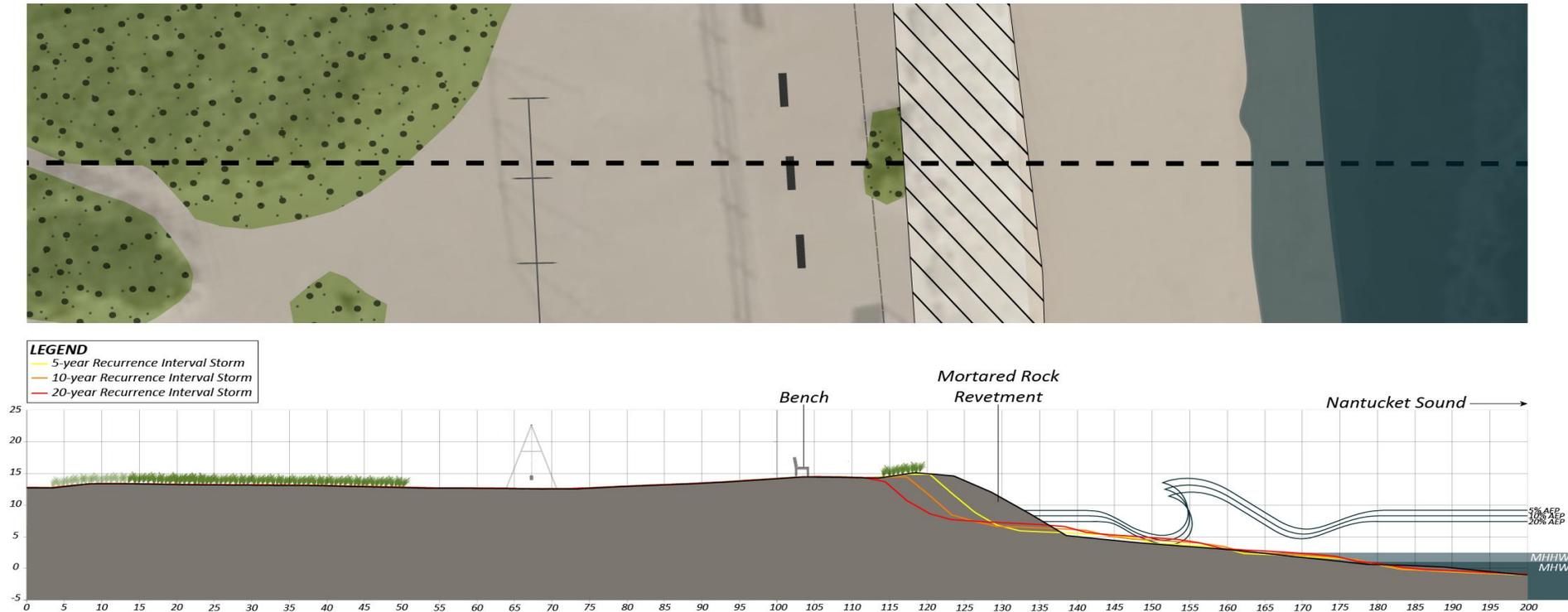
### EXISTING REVETMENT - 2030 PERFORMANCE

Haigis Beach, Dennis

# Coastal Processes Analysis – Sediment Transport

## 5-, 10-, 20-year storm cases wo/ Revetment (2030)

- With the revetment removed from the analysis and natural dune landform exposed, results show increasing severity of erosion during 5-, 10-, and 20-year storm events through 2070.



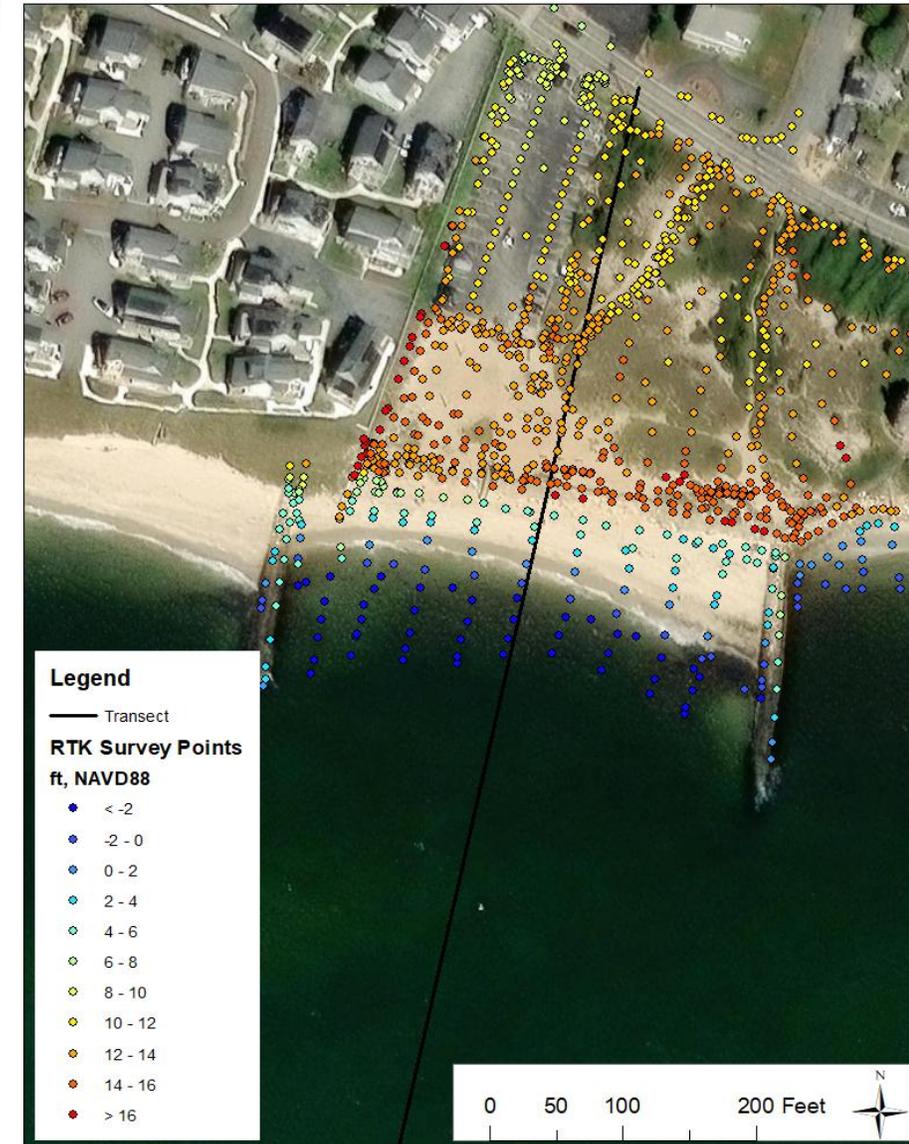
### REVTMENT REMOVED - 2030 PERFORMANCE

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# Coastal Processes Analysis – Key Takeaways

- Shoreline is erosive
- High tide line expected to increase through 2070
  - Less high tide beach
- Storm water levels expected to increase through 2070
  - Greater risk of over topping
- Significant differences in post-storm beach and dune profiles with and without coastal engineering structure
- Analysis informs conceptual design

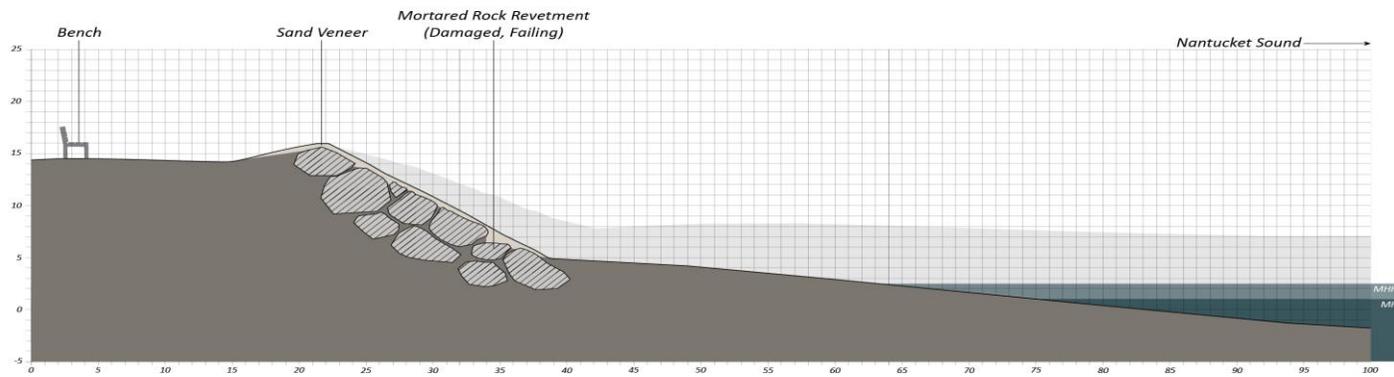
***Case to be made for maintaining shoreline protection  
in this location***



# Development of Conceptual Alternatives



HAIGIS BEACH: EXISTING CONDITIONS



EXISTING CONDITIONS  
Haigis Beach, Dennis

- Focus on improving resilience to coastal storms, public safety, and maintaining access to the shore
- Considering a full suite of alternatives for upland areas and coastal protection
- Each feature should be considered an “*a la carte*” option – fully customizable approach
- Work towards a preferred alternative that embodies Town and community vision for the site

# Town, Neighbors, Public – Key Considerations or Concerns?

- What is the most important element for the project team to consider?

*May include but not be limited to...*

- Aging Infrastructure
  - Public Access & Public Safety
  - Recreation
  - Amenities
  - Degraded Habitat
  - Coastal Erosion
  - Coastal Flooding
  - Stormwater Flooding
  - Emergency Access
- What is your favorite aspect of the site?
  - What is your vision for the future?



# Next Steps

- **Conceptual Alternatives**
- **Public Education & Outreach** – 2<sup>nd</sup> public meeting to discuss alternatives
- **Final Summary Report**



An aerial photograph showing a residential development on the left with several houses and a parking lot. A large, undeveloped plot of land with sparse vegetation and a dirt path is in the center. To the right, more houses are visible, some with swimming pools. The bottom of the image shows a sandy beach and the ocean with waves breaking. A stone wall runs along the edge of the beach.

Questions?

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