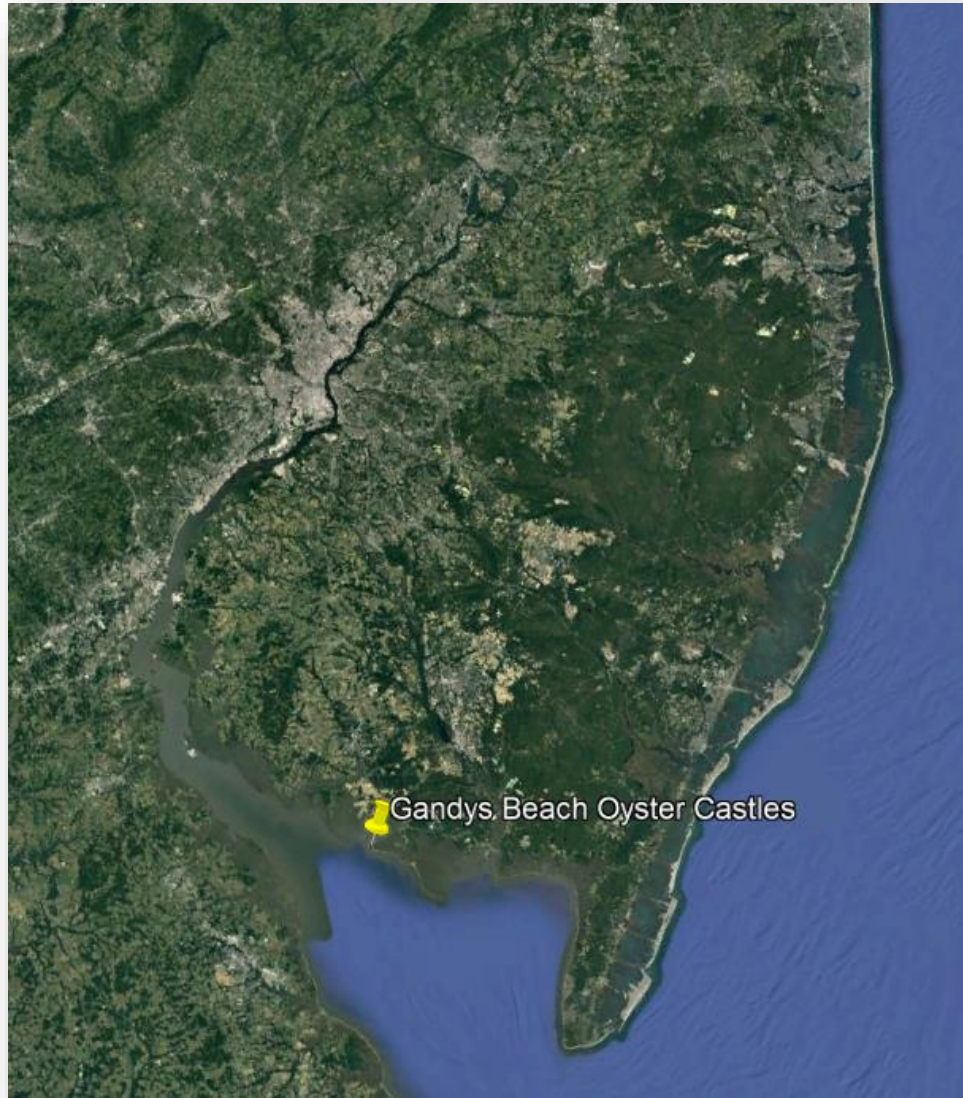


# Overview of NNBF Project Monitoring

Case Study from Gandys Beach, NJ

Jon K. Miller

# Gandys Beach



# Project Objectives



## ↑ Constructability of Living Shorelines

- Stable materials
- Volunteer-built
- Logistics
- Learn



## ↑ Shoreline Stabilization

- Protect beach habitat
- Control erosion
- Attenuate waves
- Maintain or increase:
  - Sediment
  - Elevation
  - Vegetation extent



## ↑ Ecological Uplift

- Use living features
- Recruit and increase oysters
- Enhance fish habitat
- Facilitate natural processes
- Passage of horseshoe crabs



## Advance Restoration & Living Shorelines

- Create learning landscape
- Long-term monitoring
- Share results
- Transfer lessons learned
- Overcome hurdles to restoration

# Overview of Ecological Monitoring



RUTGERS

New Jersey Agricultural  
Experiment Station

HASKIN SHELLFISH  
RESEARCH LABORATORY



The Nature  
Conservancy



Annual monitoring metrics:

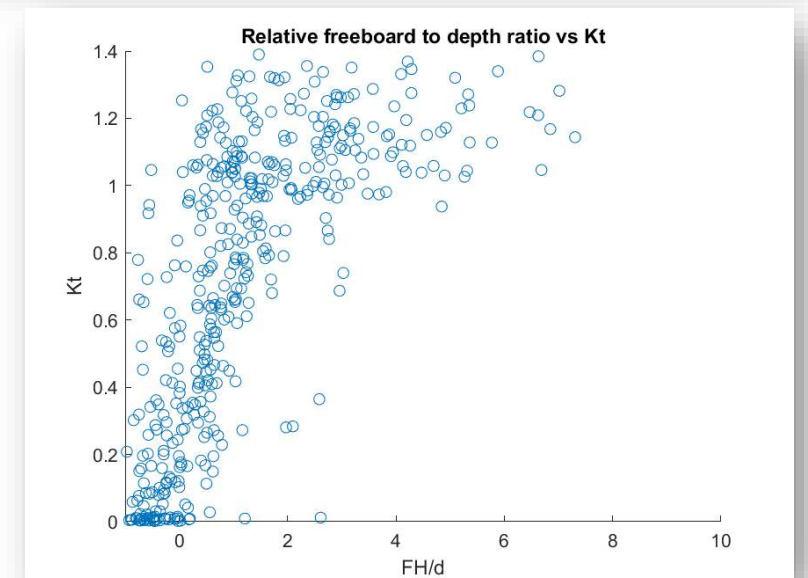
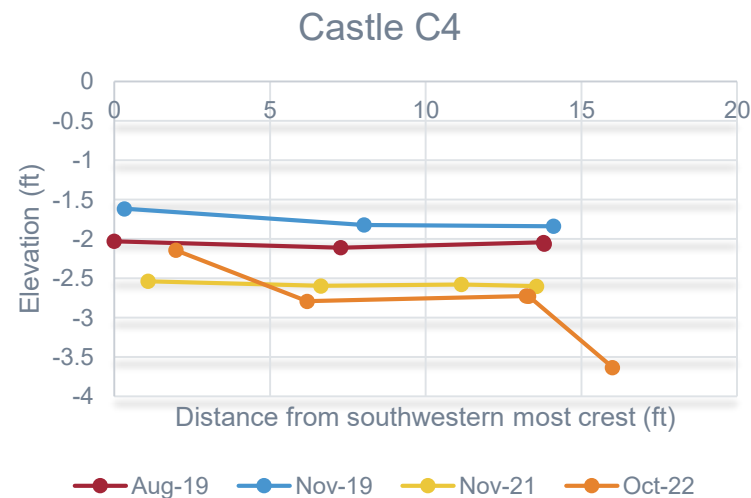
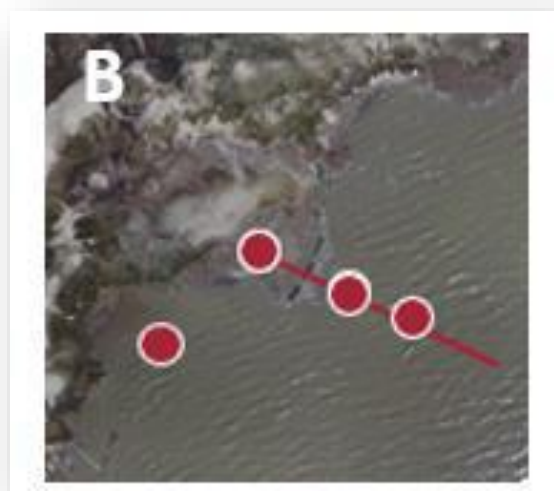
- Extent of Vegetative Community (patch size and extent)
- Oyster Community Composition (oyster density, size frequency and survival)
- Mobile Nekton Community (abundance, richness and diversity)
- Horseshoe Crab Impingement



# Overview of Engineering Monitoring

Monitoring metrics:

- Structural integrity
- Wave energy
- Site topography and bathymetry
- Crest elevation
- Results reported in (Bredes et al., 2022)



# Proposed Engineering Assessment Approach

- Different levels of assessment defined (\$imple -> Rigorou\$\$\$)
- Recommended inspection interval based on present condition and consequence of failure
- Structural assessment generally follows ASCE Waterfront Inspection MOP – integrity
- Performance Based Assessments
  - Ecological and Engineering
  - Relies on pre-defined, quantifiable objectives and...
  - Reliably measured / estimated metrics
  - Results in recommended action

Level	Description	Structural	Performance
I	General Visual inspection	Confirm as-built condition and observe severe damage/deterioration	Visually assess performance
II	Up-Close Visual / Tactile	Cleaning of surface to inspect defects normally obscured by growth	Desktop analysis; remote sensing, etc
III	Non-destructive testing	Evaluation of section loss/material degradation	Direct measurement of performance; RTK GPS, wave gauges

Rating	Coverage/Notes
Not Inspected	Not visible or accessible
Good	At or above target (>100%)
Fair	Near target (50% to 100%)
Poor	Well below target (0% to 50%)
Serious	Slight adverse (-50% to 0% of target) impact
Critical	Significant adverse (<-50% of target) impact

Yepsen, M., Moody, J., Schuster, E.,(2016).



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Conservancy



**STEVENS**  
INSTITUTE OF TECHNOLOGY  
1870

Coming soon (hopefully)....  
Estuaries and Coasts Special Issue:  
Functional Assessments of Living Shorelines

# THANK YOU

**Stevens Coastal Engineering Research Group**

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