



CHARGE LIMIT

1 PRIMARY PERIMETER CONTAINMENT (TYP.)
C-12

1 SECONDARY PERIMETER CONTAINMENT (TYP.)
C-12

2 DRAINAGE CHANNEL BLOCK (TYP.)
C-12

PIPELINE DISCHARGE LIMIT

2 DRAINAGE CHANNEL BLOCK (TYP.)
C-12

1 PRIMARY PERIMETER CONTAINMENT (TYP.)
C-12

1 SECONDARY PERIMETER CONTAINMENT (TYP.)
C-12

CELL B-02
TARGET ELEVATION: 0.75

BENEFICIAL USE OF DREDGED MATERIAL FOR RESTORATION IN BARNEGAT BAY, NJ

Nick Brown, PhD



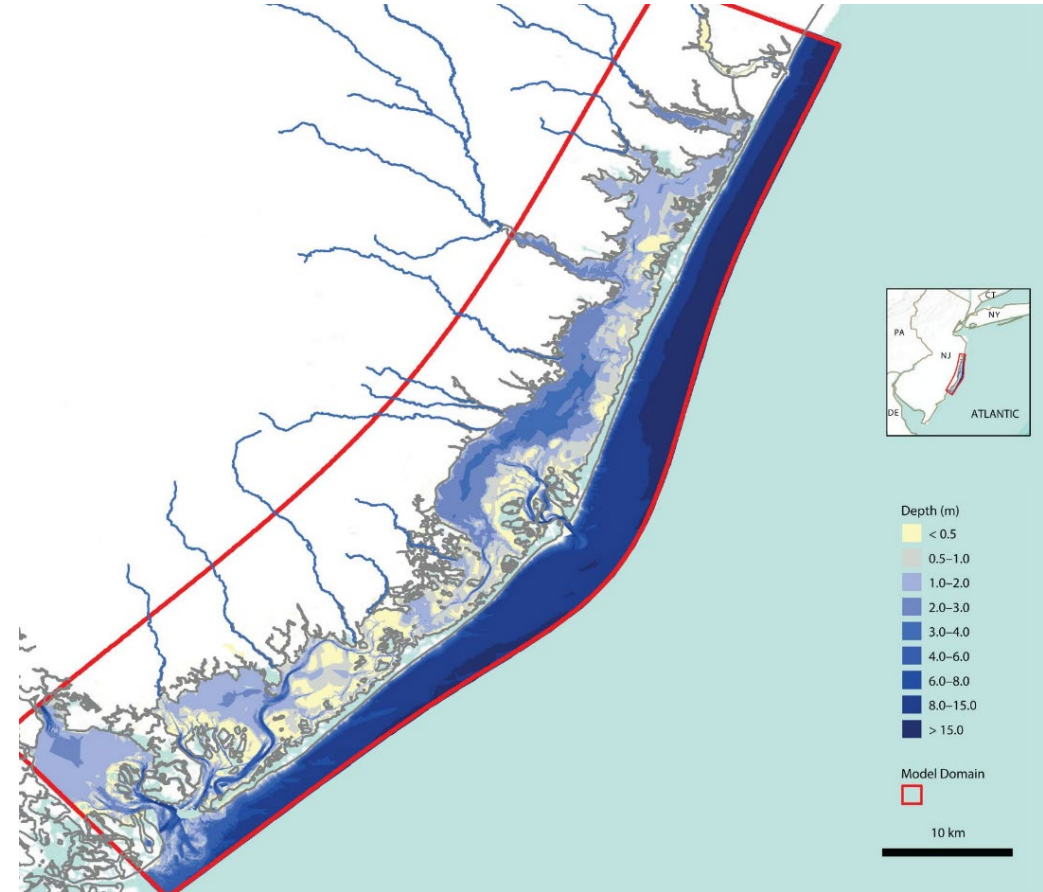
Outline

- Barnegat Bay Overview
- Restoration in the Bay
 - Types of Restoration
 - Previous Restoration
 - Ongoing Efforts
 - Future Opportunities
- Conclusions

Barnegat Bay

- 75-square mile shallow, micro-tidal, brackish, restricted lagoon
- Approximately 20,000 acres of tidal marsh
- >160 bay islands

- Low sediment accumulation and accretion
 - 11.9% of tidal wetlands lost due to internal fragmentation
 - Shorelines between 1930-2013 have eroded at ~1.6 ft/yr



Restoration in Barnegat Bay

- Marsh restoration has been identified as priority for State of New Jersey with goals to:
 - Restore altered environments to natural condition
 - Use dredged material beneficially
 - Improve and restore ecosystem services
- Methods of restoration:
 - Marsh Enhancement:
 - Thin-layer placement to vertically increase marsh elevation
 - Living Shoreline Protection and Stabilization:
 - Green and grey
 - Breakwaters, dunes, sediment run-up, coir log marsh edges, etc.



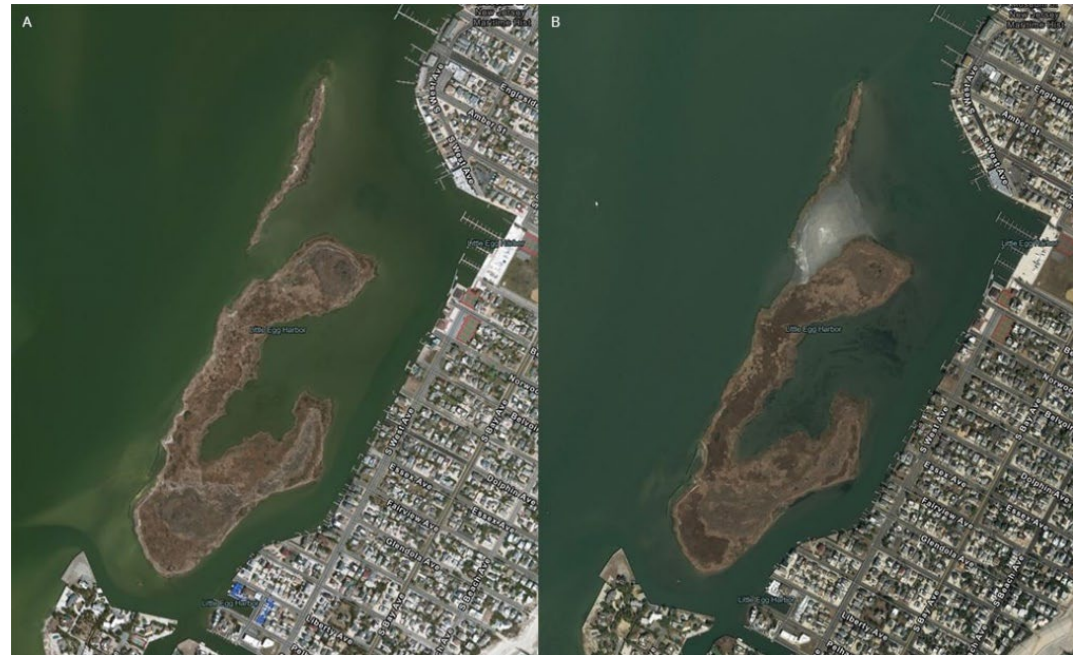
Image: NJDEP

Previous Restoration in Barnegat Bay

- Mordecai Island:
 - USACE placed sediment to fill erosional gap between parts of the Island
 - ~30,000CY of dredged material to create central high elevation mound
 - Planted with native salt marsh vegetation



Photos: USACE ENW



Previous Restoration in Barnegat Bay

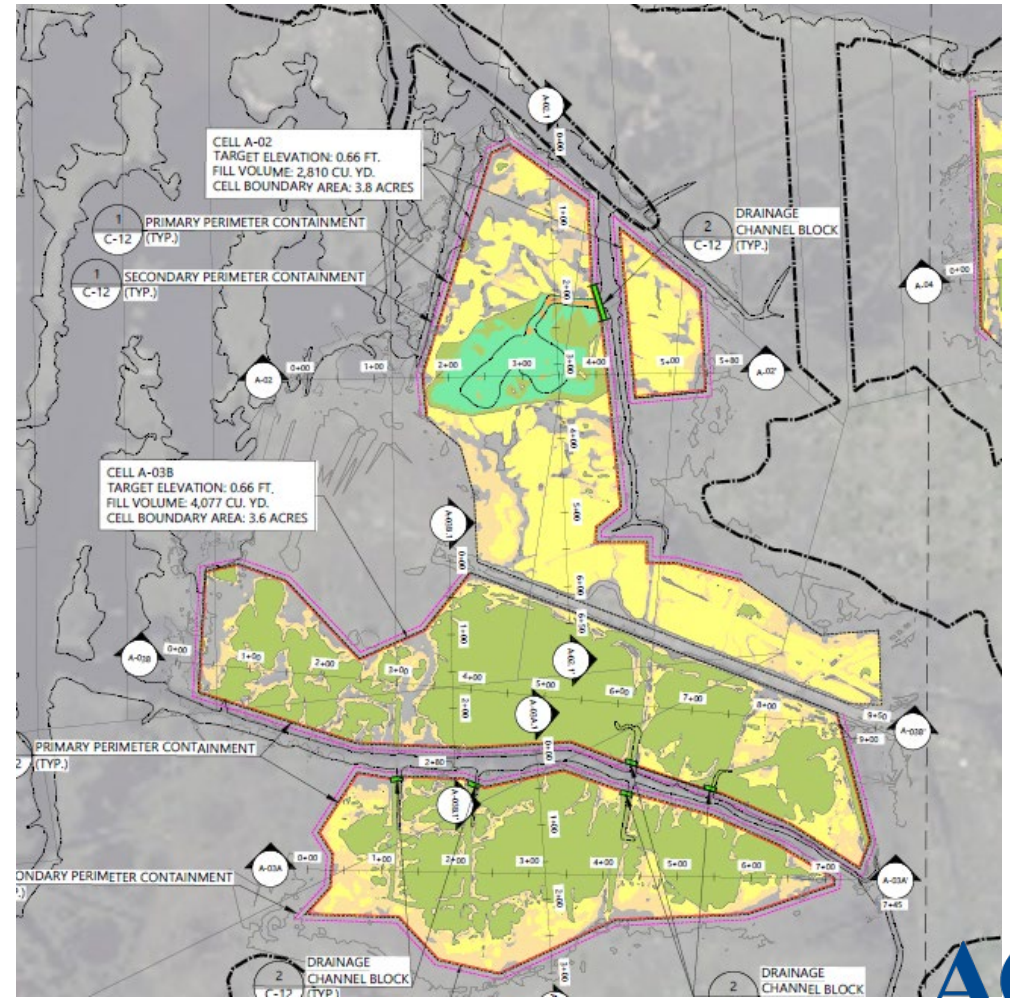
- Goodluck Point Restoration:
 - Marsh restoration: Thin layer placement of material
- Shoreline
 - ~4,500 CY placed in nearshore from nearby navigational waterways
 - Temporary bar
 - Attempt to use natural sediment transport
 - Barone et al, 2023

Photo: NJDOT



Ongoing Restoration: Brick Township

- Restoration of marsh through thin layer placement
 - ~95 acres, 13 total cells
 - ~120,000 CY of dredged materials
 - Two years: 2024-25
 - Partially funded by NJDEP grant
- Goals:
 - Elevate to biological target elevation
 - Restore natural ecosystem services
 - Carbon sequestration



Ongoing Restoration: Stafford Township

- Marsh protection and restoration:
 - ~17 acres of marsh
 - ~80,000 CY dredged material
 - Planned 2024
 - Funded by NJDEP grant
- Living Shoreline:
 - Planned gentle sloping sand “beach”
 - Submerged wave attenuation sill
 - Small dune on marsh to attenuate large waves
- Goals:
 - Reduce rapid edge erosion
 - Elevate and revegetate marsh surface

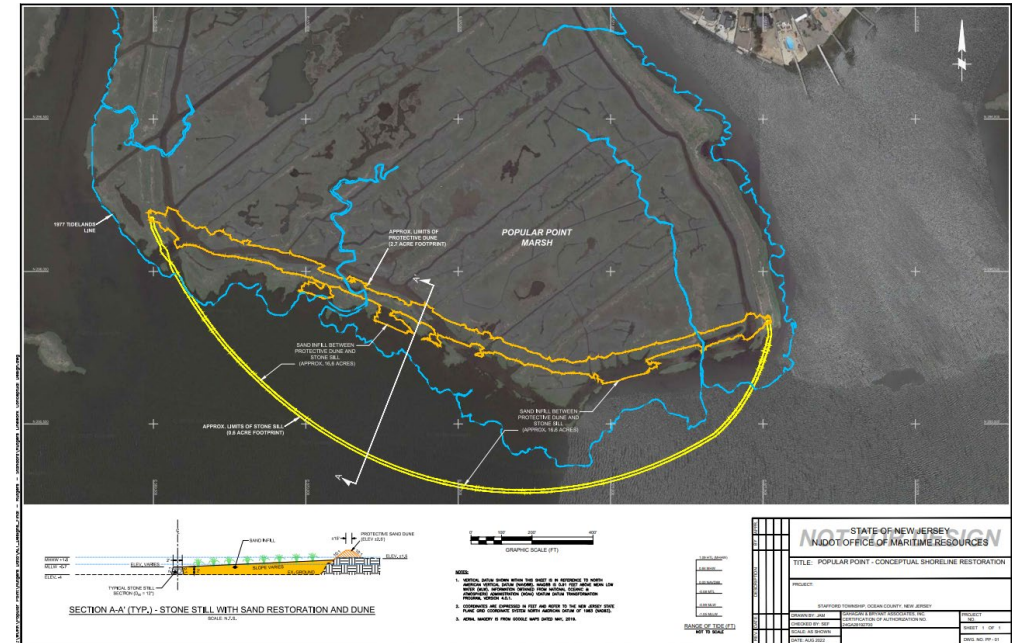


Photo: NJDOT OMR

Ongoing Restoration: Stafford Township

- Marsh protection and restoration:
 - ~34 acres of marsh
 - >10,000 CY dredged material
- Marsh Platform:
 - Thin layer placement of sediment to biological target elevation
 - Infill ponds that are increasing in size
- Goals:
 - Infill mosquito ditching
 - Elevate and revegetate marsh surface

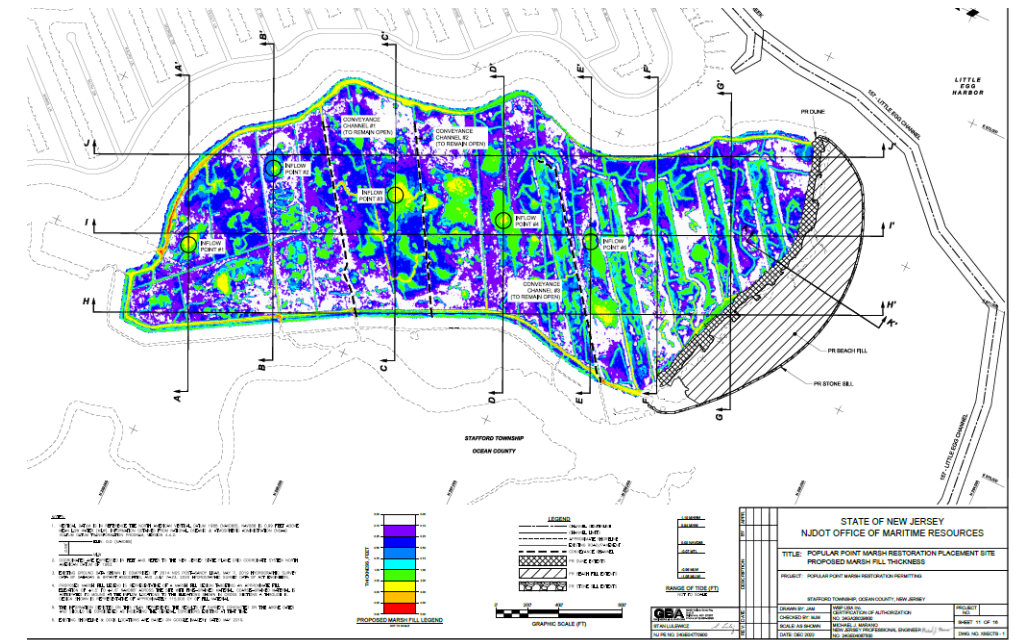


Photo: NJDOT OMR

Ongoing Restoration: Cattus Island

- Living Shoreline:
 - Scoped to contain breakwaters at Page's Point.
 - Anticipated infill behind breakwaters
 - Estimated 2024-25 construction
 - Goals: stabilize shoreline edge and attenuate waves
- Marsh:
 - ~48 acres of scoped restoration
 - Thin layer placement of dredged material
 - Estimated 2025-26 construction
 - Goals: vertically elevate marsh and restore ecosystem services

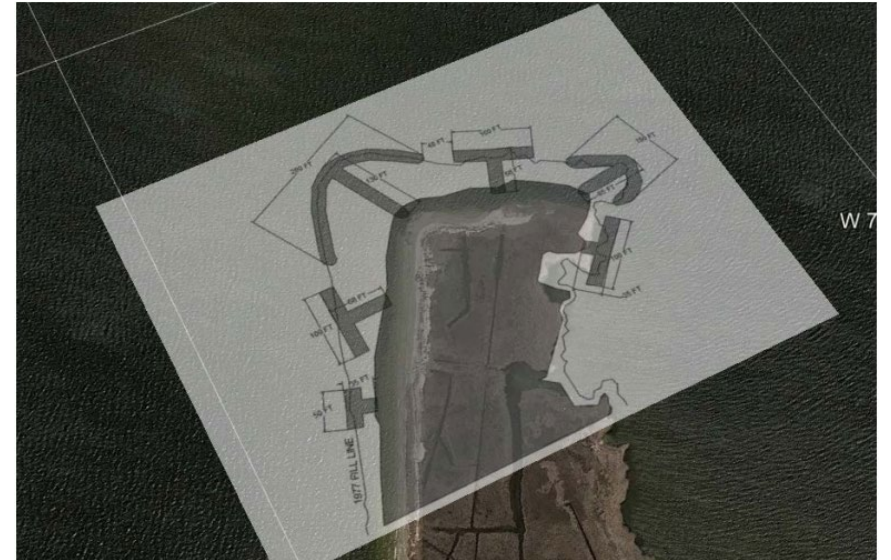


Photo: Stevens Institute of Technology



Photo: Ocean County Parks



Future Restoration Steps

- Seek planning funding
 - Competitive but available
- Coordinate with local partners
 - USFWS, NJDEP, NJDOT, Non-profits, Municipalities, etc.
- Implementation funding is key
 - Currently widely available:
 - NOAA, NFWF, and various Bill funding (IRA, IIJA, RISE, etc.)

Future Restoration

- **32-42%** of Barnegat Bay's marshes are at risk of drowning, erosion, and losing ecosystem services
- Under moderate sea level rise conditions, **~83,000 acres** of New Jersey's marshes are projected to drown or erode
- Dredging needs in Barnegat Bay exceed **1,000,000 CY** in the next decade



Conclusions

- Barnegat Bay is at great risk of losing significant marsh due to climate change
- Small scale restoration projects have been implemented previously
- Large scale projects are in the pipeline for implementation
- State of NJ is seeking projects to build their pipeline of future work
- Future restoration of Barnegat Bay will be very busy
- Ultimate goal: maintaining and protecting ecosystem services provided by marshes



Questions?

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