

Engineering With Nature: Constructing Islands with Dredged Sediment

Danielle Szimanski

US Army Corps of Engineers: Baltimore District

ASBPA: National Coastal Conference

November 1, 2018

Galveston, Texas



Overview of Projects

- Barren Island
- Fishing Battery/Susquehanna River
- Ocean City Projects
 - Sinepuxent Bay and Isle of Wight Bay
- Swan Island –Smith Island



Barren Island -Dorchester County, MD



Barren
Island

Barren Island

- Multiple years and multiple projects
 - FY2000, FY2004, FY2008
- Dredged approx. 485,000 cubic yards since 2000
 - Confined placement with stone
 - Long-term erosion rate of 14 ft. per year
- Restored 14+ acres of habitat
 - High marsh, low marsh, migratory bird habitat
- Segmented breakwaters on western end of island allow for full tidal flow into marsh



Barren Island

Costs

- Average Contract Price: \$3.2 million
- Average Cost per Cubic Yard: \$4.64.00
- Funding was a mix of O&M and supplemental (FY08)

Issues

- Winter weather
 - Equipment, geotextile tubes
- High fetch area
- Minimal O&M funding for future work
- Fine grain material needed to be contained due to MD State Law





Barren Island

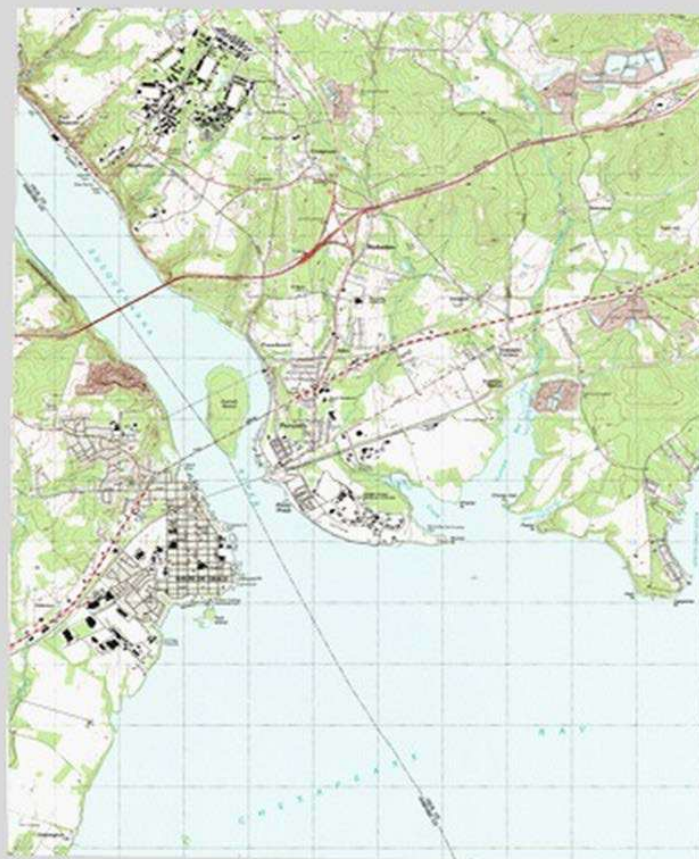
Summer 2004



Summer 2006



Fishing Battery – Havre de Grace, MD



Fishing Battery

- FY2013 Maintenance Dredging of the Susquehanna River
 - Tropical Storm Irene storm funds
- Dredged approx. 200,000 cubic yards
 - Unconfined placement
 - (97% medium grain sand)
- Restored 11 acre island
- Wetland, transitional marsh, and high marsh created
- 11 different plant species placed
- Shallow water habitat creation



Fishing Battery

Costs

- Cost of contract: \$2.06 million
- Cost per cubic yard: \$3.12
- No containment costs

Issues

- Close placement site
- Human aspect
- No additional placement
- Storm funds
 - Last dredged by O&M in 1986



Fishing Battery



Pre-placement
(2010; via Google Earth)



Fishing Battery



Spring 2013
(Less than 1 month post placement)

Summer 2014



Fishing Battery



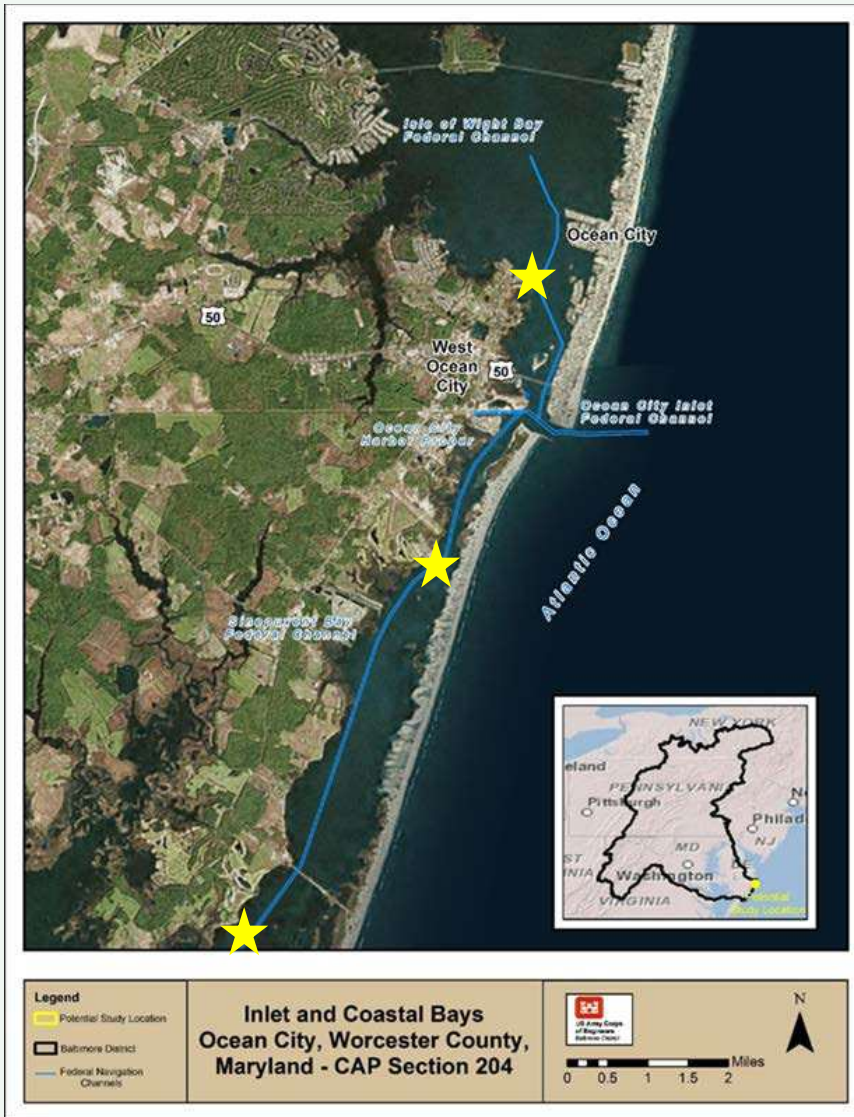
July 2015



June 2017 (via Google Earth)

Ocean City Projects

- Sinepuxent Bay Island Restoration
- Isle of Wight Island Restoration



Sinepuxent Bay and Isle of Wight Island Creation

- FY2014 - FY2016
 - Hurricane Sandy funds
- Dredged approx. 400,000 cubic yards
 - Unconfined placement (fine/medium grain sand)
- Restored 4 historic islands
 - Two vegetated, two bare
- Migratory bird nesting habitat
- Shallow water habitat creation



Sinepuxent Bay and Isle of Wight Island Creation

Costs

- Cost of Contract: \$5.5 million
- Average cost per cubic yard: \$7.87

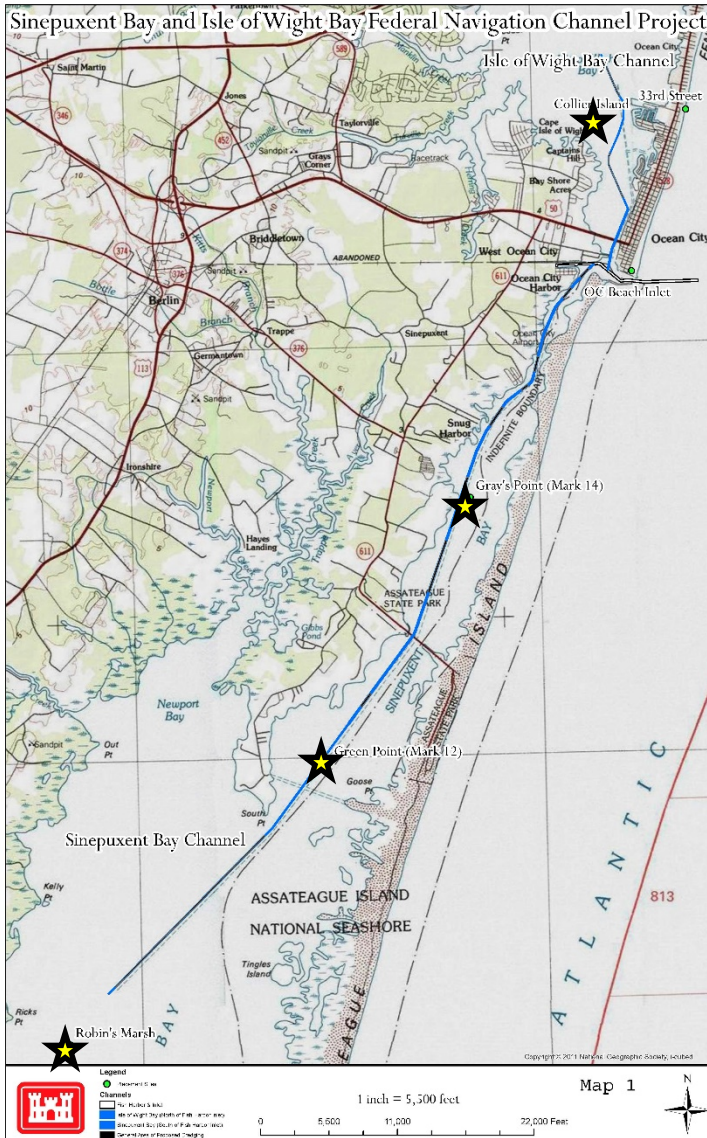
Issues

- Long pumping distance
- Previous dredging in 1966 in Sinepuxent
- Highly dynamic system
- Human aspect in Isle of Wight



Sinepuxent Bay and Isle of Wight Island Creation

Mark 12 Fall 2014



Robins Marsh Summer 2015

Sinepuxent Bay and Isle of Wight Island Creation

Robins Marsh Summer 2016



Tern Island Fall 2015

Sinepuxent Bay and Isle of Wight Island Creation



Tern Island Spring 2016

Tern Island Summer 2015



Swan Island Restoration



(Maps via Google)

- FY16/FY17 maintenance dredging of Smith Island federal channels
- Approximately 80,000 cubic yards of silt and sand to be removed
- Island is natural breakwater for the town of Ewell on Smith Island
- High and low marsh created
- Contained with coir logs, hay bales, armored concrete units, sand dune
- Currently underway!



Swan Island Restoration



Swan Island Design



December 2017



Swan Island



2-1 Stack Toe Protection

- A-Jacks used for toe stabilization
- Can be assembled around a radius
- 2-1 stack requires support of top unit by backfill or bank



www.ContechES.com



(Via Armortec)



Questions?

