

THE DELAWARE BAY BEACHES: SAND NEEDS FOR COASTAL PROTECTION AND RESILIENCY

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Project Location/Overview









Presentation Overview

- Project Location
- Introduction
- Phase 1
- Phase 2
- Phase 3
- Results
- Conclusions
- Acknowledgements







- Delaware Bay
 Shoreline in Kent and
 Sussex Counties
- Primehook Beach, Slaughter Beach, Kitts Hummock, Pickering Beach
- Comprised of thin sandy estuarine barriers and broad marshes











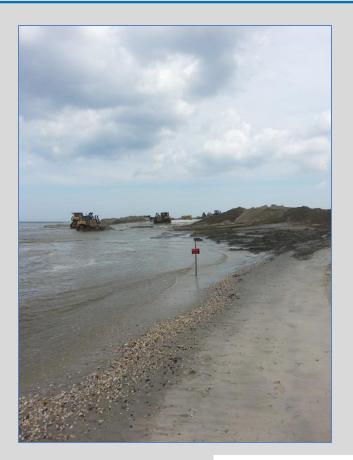
 Delaware Department of Natural Resources and Environmental Control (DNREC) is considering implementation of a major beach renourishment project







 6 million cubic yards of sand required to satisfy coastal resiliency projects (PBS&J 2010)









Four Study Areas









- Three phase approach
 - 1. Compilation and review of existing data
 - 2. Refinement of data and borrow site delineation
 - 3. Data analysis and final reporting









- Large amount of data already existed
 - CHIRP sub-bottom data
 - Roxann seabed classification data
 - Historic vibracore data

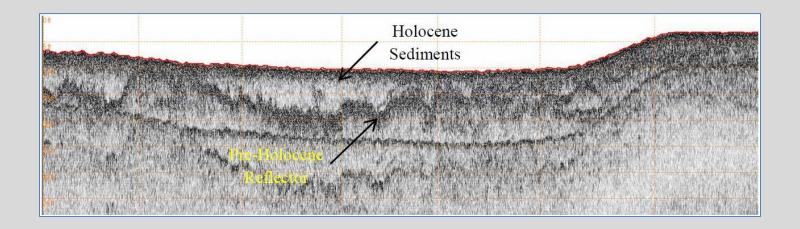








- CHIRP sub bottom Data
 - Collected from 2003-2008
 - University of Delaware, DNREC Delaware Coastal Programs
 - Outcrops of pre-holocene reflectors

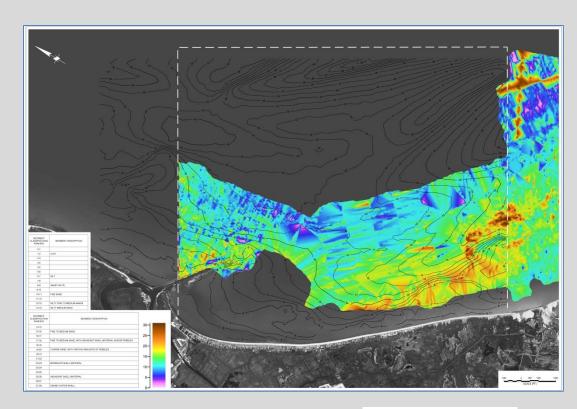








- Roxann Seabed Classification Data
- University of Delaware, DNREC Delaware Coastal Programs
- First two returns from an echo sounder are analyzed
- Characterizes the roughness and hardness of the seafloor
- Calibrated and "ground truthed" with grab samples



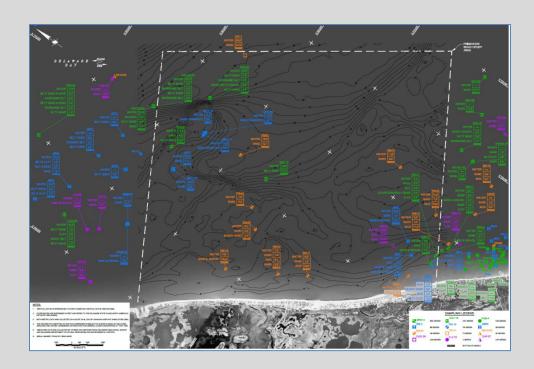






- Existing Vibracore Data
 - Delaware Geologic Survey
 - Cores within each study area identified and their logs were obtained
 - Logs reviewed for sand deposits

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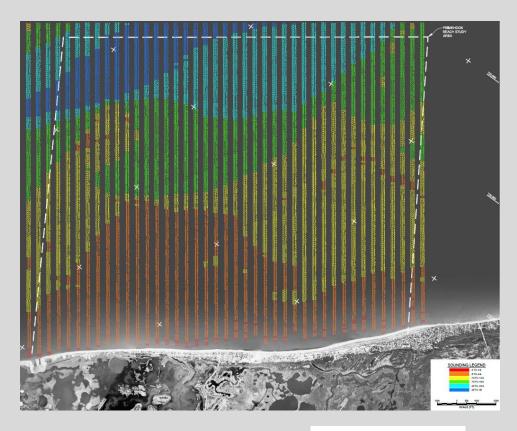








- New Bathymetric Data
 - GBA performed a single beam hydrographic survey
 - 500 foot line spacing
 - Lines extended 3 miles offshore



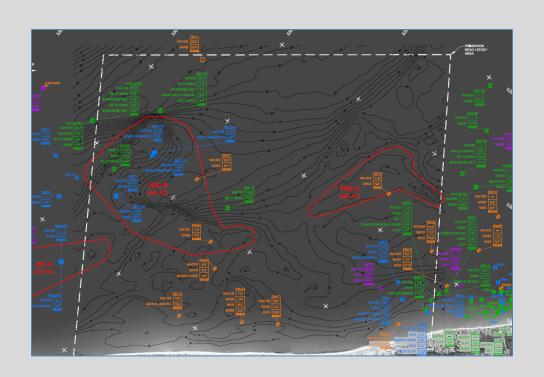






Data Correlation

- Primary and secondary areas of interest were developed
- Primary areas had more than one dataset indicating potential sand
- Secondary areas had only one dataset indicating potential sand



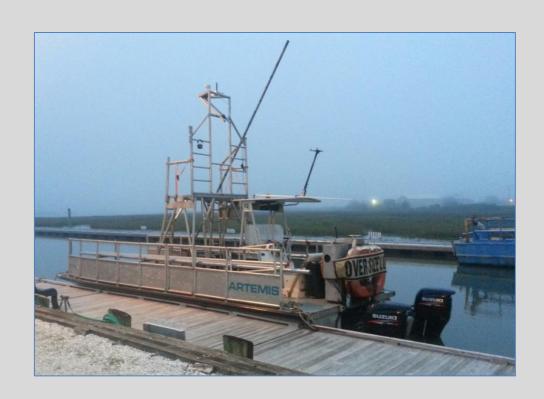






Vibracores

- Coring plan developed from, areas of interest
- 50 cores collected over 4 days, (Athena Technologies)
- Some core locations adjusted "on the fly"









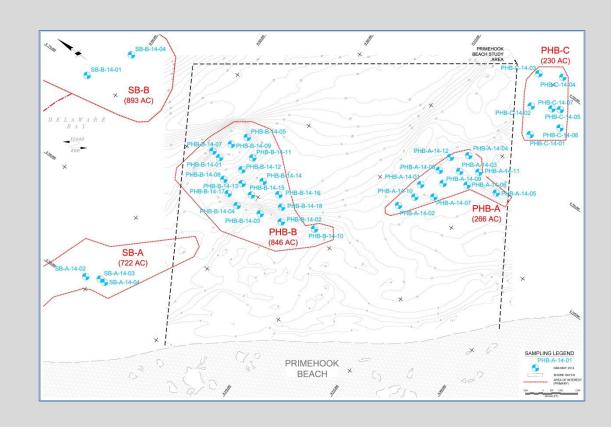
- Core logging and sediment analysis
 - Cores were logged, sampled, and photographed
 - Half of each core was archived and delivered to the DGS core repository
 - Grain size analysis
 - Composite statistics were developed for each core and each area of interest







- Data Analysis
 - Borrow areas were delineated
 - Volumes calculated for potential borrow areas









Results

- Pickering Beach and Kitts Hummock
 - Seven cores collected
 - No viable source of beach sand within either of the study areas



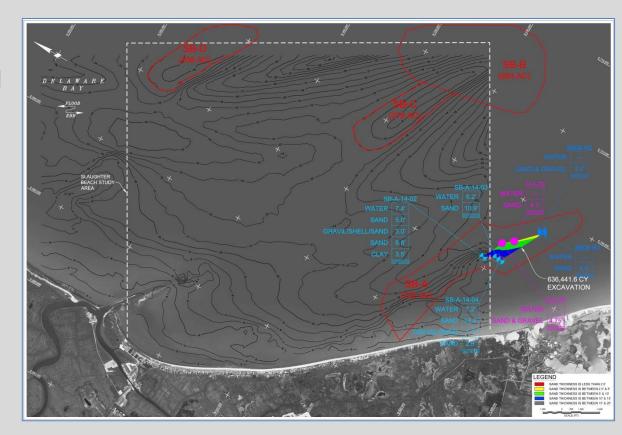






Results

- Slaughter Beach
 - 600, 000 c.y. of sand
 - 4,000 ft. offshore



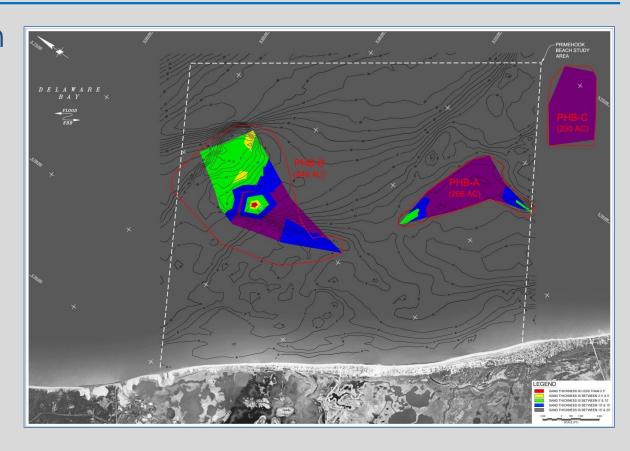






Results

- Primehook Beach
 - 20.9 m.c.y. of sand in 3 borrow areas
 - PHB-A
 - PHB-B
 - PHB-C









Conclusions

- Plenty of sand for Slaughter and Primehook beaches
- No sand within 15-20 miles of Kitts Hummock and Pickering Beach









Going Forward

- Prime Hook Beach Restoration in Primehook National Wildlife Refuge is currently out to bid
- Project will utilize borrow area PHB-B
- Total time from investigation start to construction = 2 years









Acknowledgements

- Dr. John Madsen (University of Delaware) for providing CHIRP sub-bottom data
- Bartholomew Wilson (Delaware Center for Inland Bays) for providing the Roxann Seabed Classification Data
- Dr. Kelvin Ramsey (Delaware Geological Survey) for providing historic vibracore log data
- Athena Technologies provided vibracore services







Questions?



