

Engineering With Nature Case Examples of Practice

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**05-06 October 2016
Gloucester, MA**



Organizational Perspective

Charleston District and Engineering with Nature

- Aligning natural system with engineering practices to meet authorized missions
- Mission comes first
- Where possible, use EWN principles to apply to various projects
- Opening up to seeing value in meeting multiple objectives

Photo: SCDNR



Current Projects

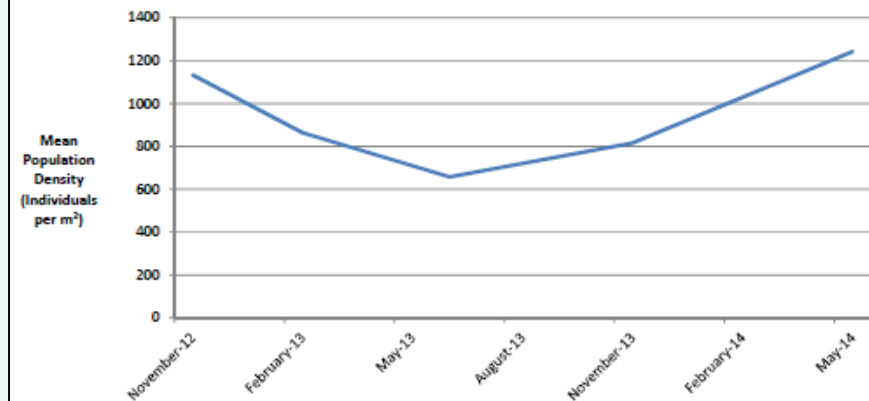
- Georgetown marsh building site (inactive)
- Oyster castles at disposal facility
- Huntington Island bird nesting habitat
- Bird Key Stono bird nesting habitat
- Ocean Dredged Material Disposal site fish habitat

Shoreline Stabilization: Oyster Castles

- Pilot Project for protection of a disposal area on the AIWW
- Multi-purpose
 - Shoreline stabilization
 - Oyster reef habitat
 - Marsh establishment
- Constructed - 2012
- 792 oyster castle blocks
- Approximately 75 linear feet
- Monitoring – 2 year post construction
 - Castle elevation did not subside
 - Oyster growth greater at higher points than lower points
 - Sediment surface elevation increased
 - *Spartina* establishment increased

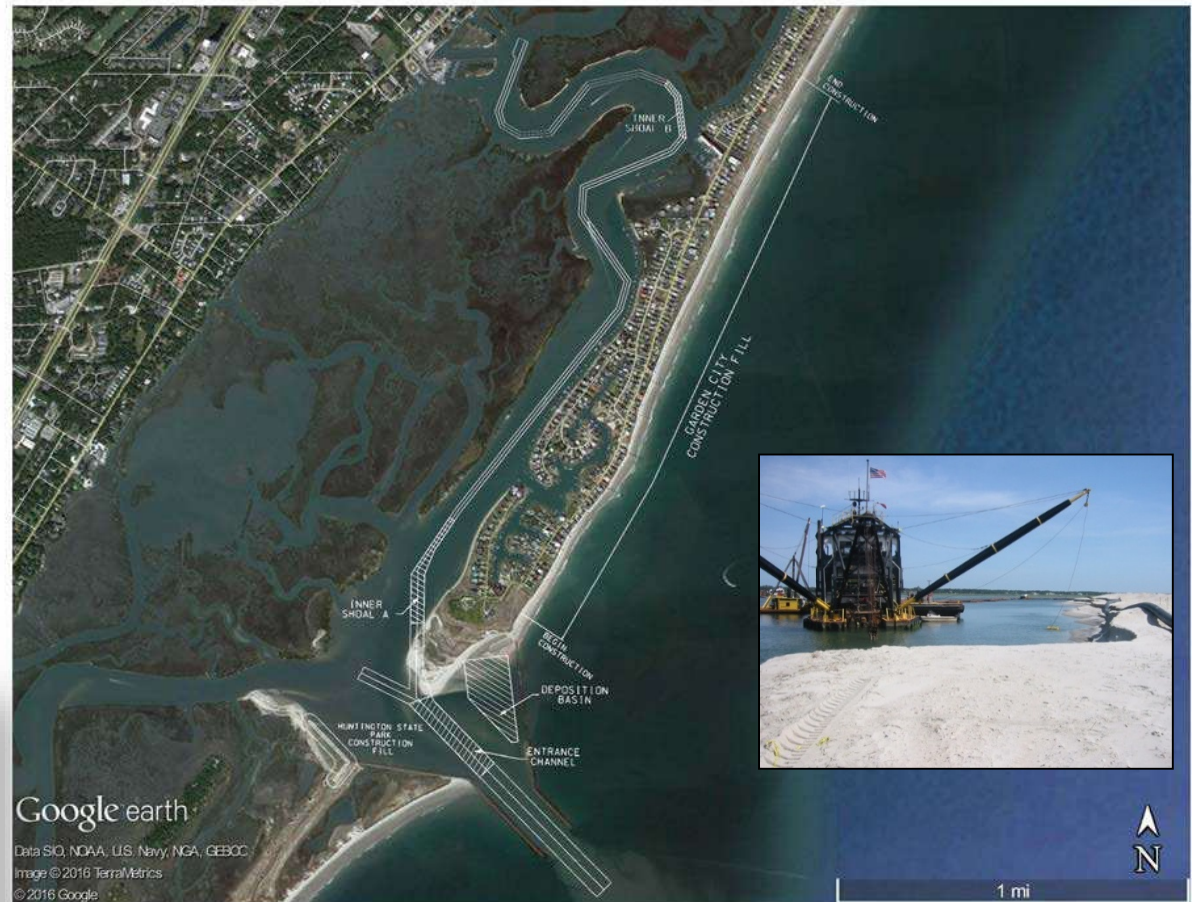


Figure 9 -
Oyster Population vs. Time



Beneficial Use of Dredge Material - Murrell's Inlet to Huntington Beach and Garden City Beach

- May 1988
- Aug-Oct 2002
- Upcoming fall/winter 2016/2017



Beneficial Use of Dredge Material - Folly River to Bird Key Stono

- 1979
- 1982
- 1984
- 1985
- 1987
- 1988
- 1990
- 1991
- 1992
- 1997
- 2000
- 2003
- 2006



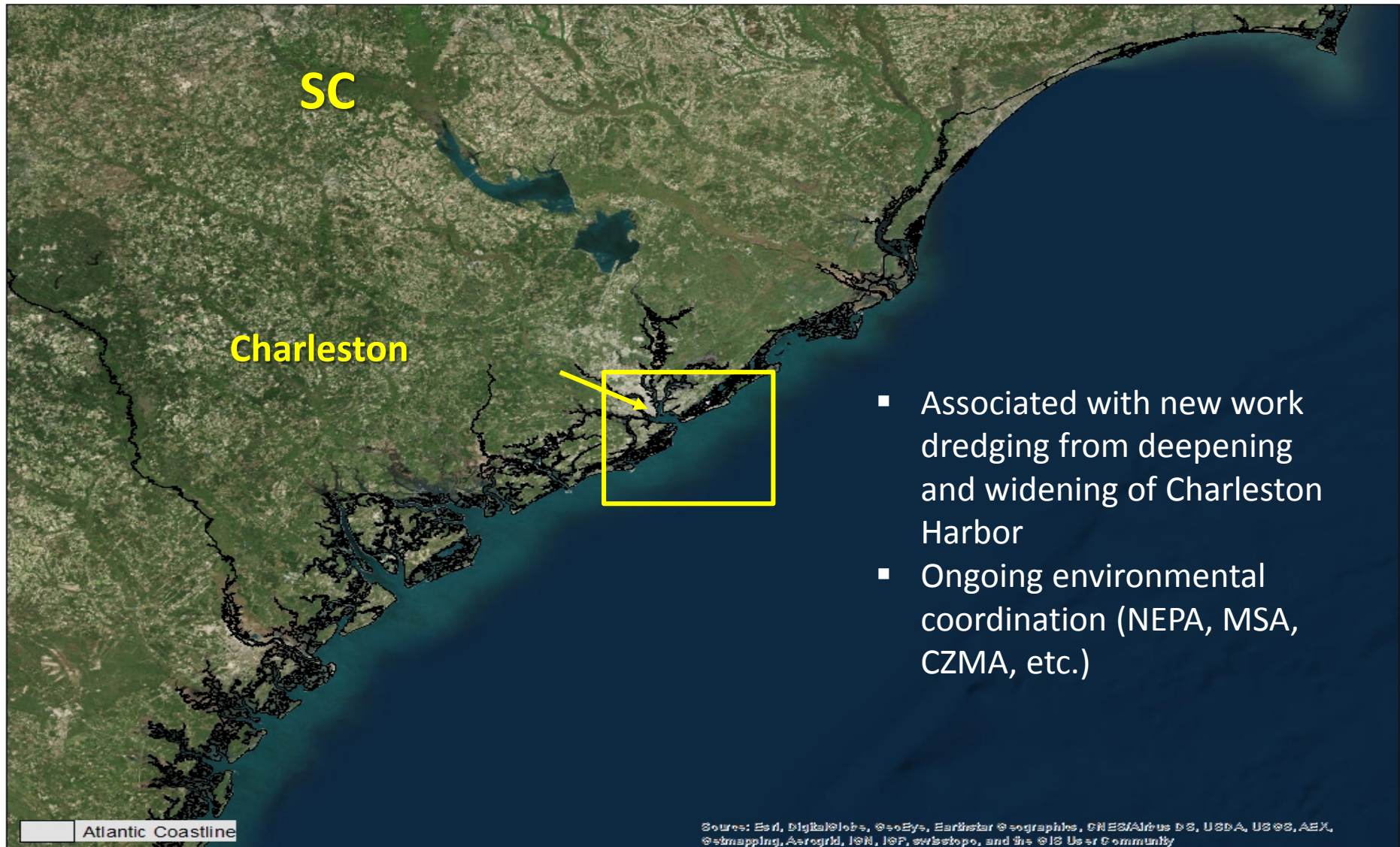
Significant Outcomes/Value Produced

- Keeping sand in the “system”
- Creating/enhancing bird habitat
- Creating oyster habitat
- Enhancing/Creating fish habitat
- Biggest value is when multiple objectives are met
 - Cheaper disposal of material & creation of habitat
 - Protection of USACE asset & creation of habitat

Challenges

- Tradeoffs
- Who wants our material?
 - Not a lot of high sand content
- Cost sharing sponsors
- Project costs
- Federal Standard – Least cost environmentally acceptable disposal method
- Difficulty getting costs \leq upland/ocean disposal
- Monitoring?
- No major environmental damages in SC

Future Opportunities



- Associated with new work dredging from deepening and widening of Charleston Harbor
- Ongoing environmental coordination (NEPA, MSA, CZMA, etc.)

Future Opportunities

- Rock reef creation
 - ODMDS, new reefs, SC Dept of Natural Resources reefs
- Soft limestone from portion of navigation channel
- Mounded reefs

