JEKYLL CREEK:
BENEFICIAL USE PILOTS

Savannah District

Jacksonville District

RSM RCX

Clay McCoy, PhD

RSM Regional Center of Expertise

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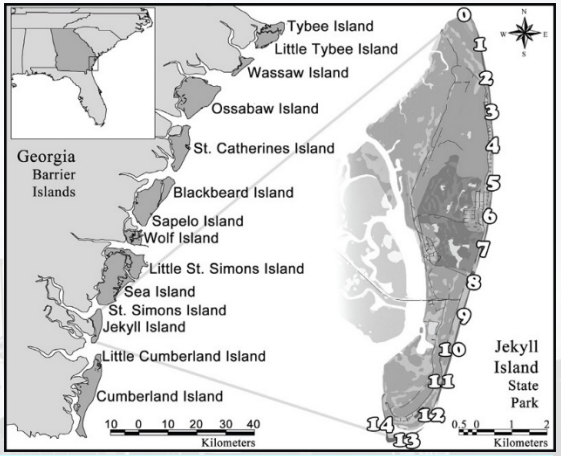
Why Jekyll Creek?

- Long-standing navigation concern
- Shallowest point in 160+ mile Georgia AIWW (0.5 ft MLLW)
- Remove nearly 500,000 CY to return to authorized dimensions
- **Programmatic effort to develop and support economically efficient and environmentally acceptable beneficial use strategies for IWW and shallow draft throughout South Atlantic Division**



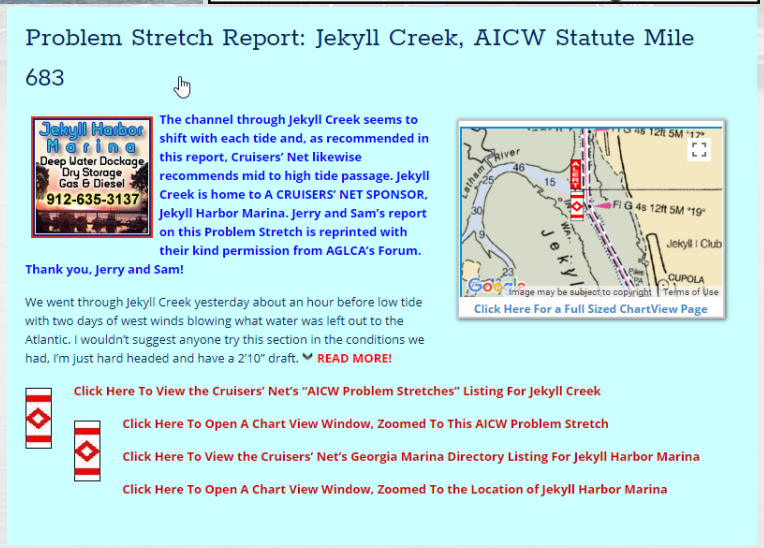


Image references:
Southeasternphotography.com
Clicktour.info
Cruisersnet.net

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Challenges

- No upland placement area available
- Offshore placement prohibitively expensive
- Limited funding (shallow draft)
- More material in channel than we can afford to move
- Collaborative effort between SAS, SAJ, RCX

Depth	Full 150 ft Width (CY)	West Half (CY)	**East Half (CY)**
-12 ft mllw	407,000	219,000	188,000
-10 ft mllw	223,000	125,000	97,000

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Building Support

- 2016:
  - Site visit by Division General
- 2017:
  - Feb: Stakeholder meeting with AIWA at Jekyll
  - Apr: Thin Layer Placement Permitting and Regulation Meeting at Jacksonville Beach, FL
  - Summer: Partnership between SAS, SAJ, RSM RCX to execute the project
  - Summer: Letters of support from:
    - GA DNR Coastal Resources Division
    - NOAA National Marine Fisheries Service
  - **Oct: Kicked off Plans and Specs**
  - Nov: AIWA presentation, Wilmington, NC

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Agency and Stakeholder Collaboration/Coordination

- Kick-off: 17 Dec 2018 @ GA DNR in Brunswick, GA
- GA DNR, NOAA, USFWS, EPA, JIA, TNC, SAS, RSM RCX
- Proposed 2 Beneficial Use Strategies: Marsh Thin Layer Placement (TLP) and Open Water Placement
- Agreed to framework of placement strategies, anticipated schedule, general construction methods, and monitoring requirements

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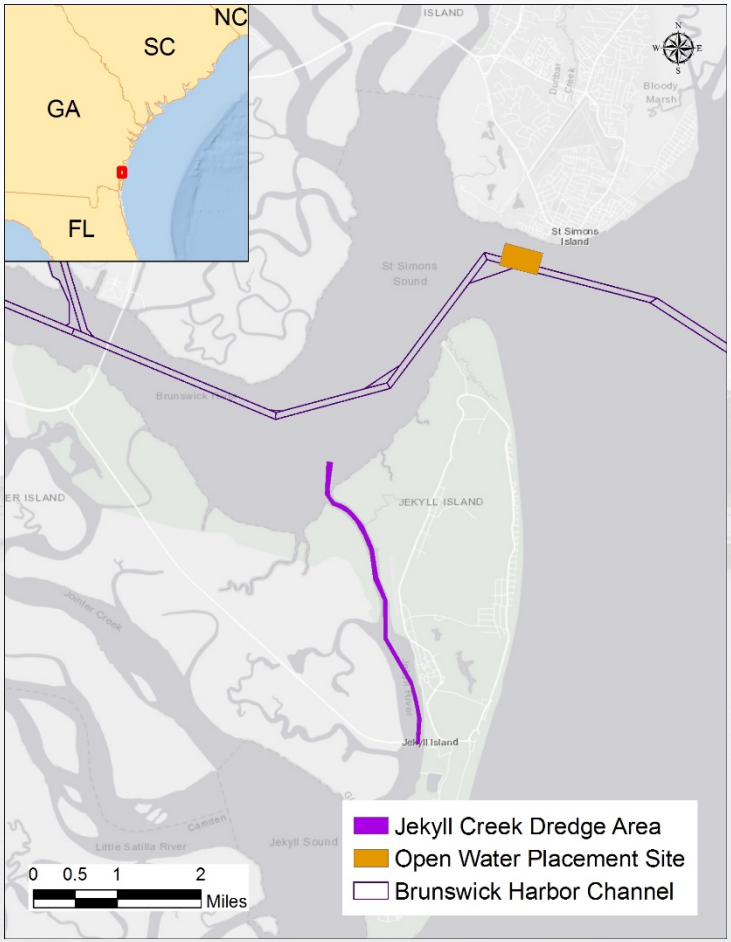
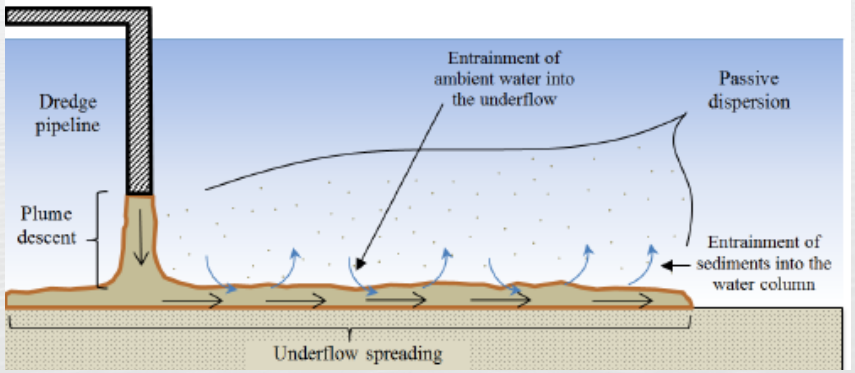
Open Water Placement

- Strategy to retain and disperse sediment in coastal system
- Comparable to Hilton Head-Calibogue Sound project
  - Dredged material: high silt/mud content
  - Tidal range: 6-8 ft
  - Placement area: rippled sandy bottom
  - Placement method: pipeline and near bottom placement
  - Volume: HH-300,000 CY, BH-150,000 CY
  - *Placement depth: HH-26-28 ft, BH-40-60 ft





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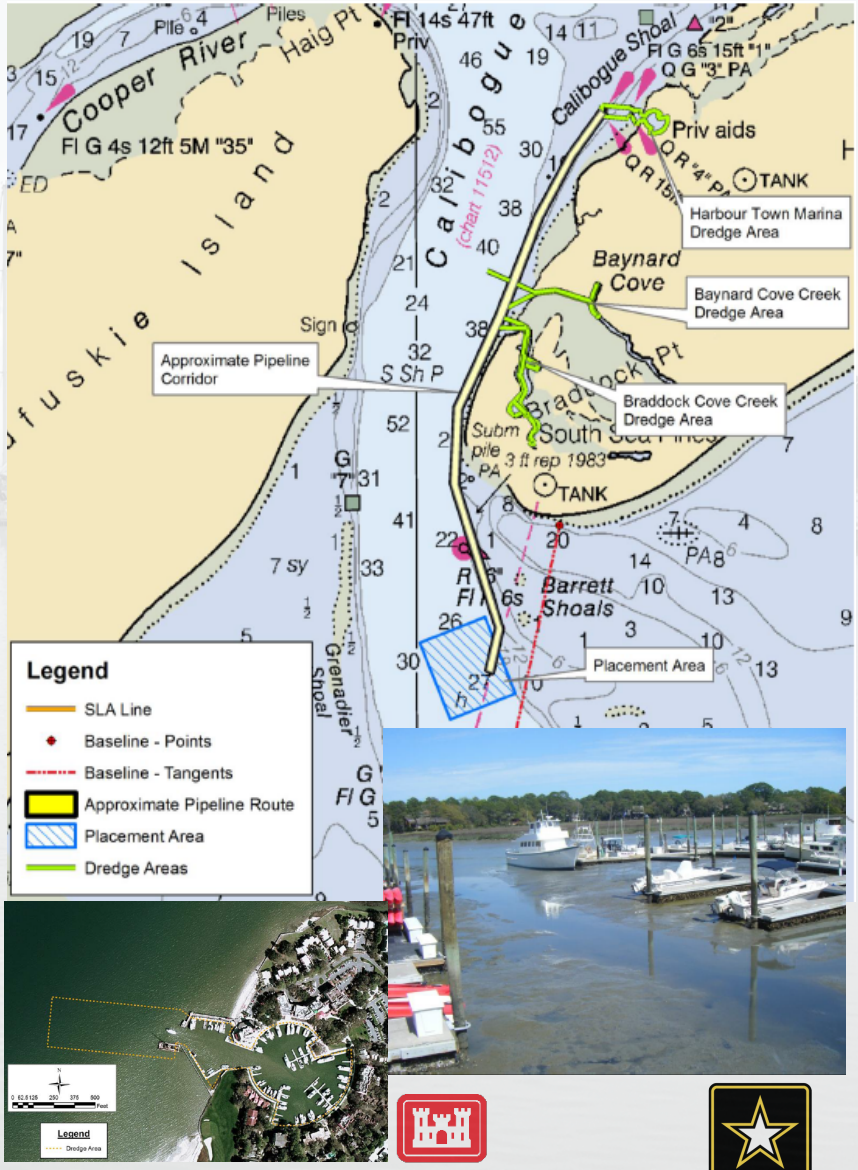
Hilton Head Monitoring Results

- Placement area
  - sediment characteristics returned to pre-project condition
  - similar level of biological abundance and diversity

"Placing dredged sediments into the permitted area using the techniques employed by this project does not cause unacceptable adverse environmental impacts to the bottom sediments and can be safely employed at this location in the future."

- Permit modifications for 2nd event:
  - Reduce on-site monitoring to bathymetry and sediment type only
  - Enlarge dredging footprint by 0.121 acres



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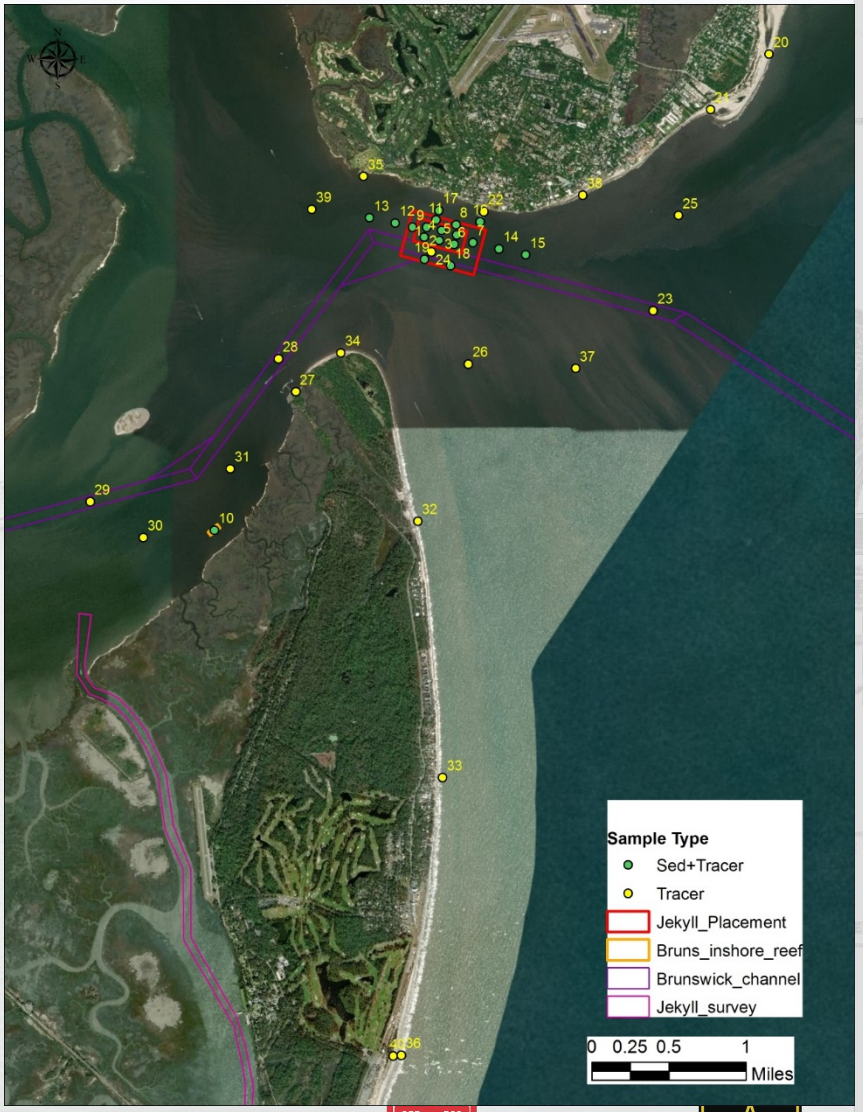
Jekyll Open Water Monitoring

- Pre, post, post +3 - 6 months, post +6 - 12 months
- Monitoring conducted by Savannah District and LG2
- Characterization of dredged material
- Side scan sonar of placement area, buffers, 300-500 feet beyond buffers, inshore reef
- Sediment characterization (N=20): grain size distribution, bulk density
- Sediment tracer study (N=40) to define sediment dispersal



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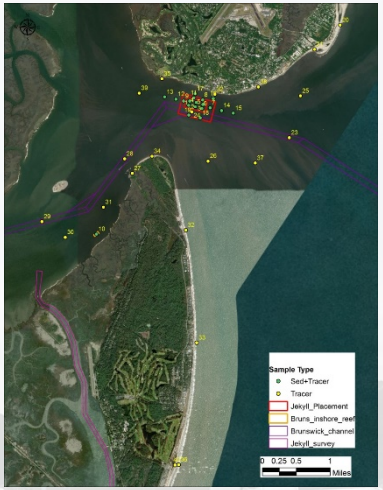
Jekyll Open Pre-Con Sampling

- Collected 5 cores in Jekyll Creek to characterize sediments
- Collected 20 grab samples to characterize placement area conditions
- Shipex Sampler



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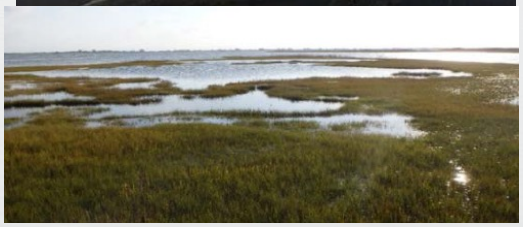
Thin Layer Placement

- Salt marsh restoration common method to support coastal ecosystems and increase resiliency

- Marshes slowly drowning in many cases (sea level rise, subsidence, groundwater withdrawals…sediment needed to help marshes keep up with relative SLR

- Recent USACE successes in New Jersey, Maryland, Louisiana



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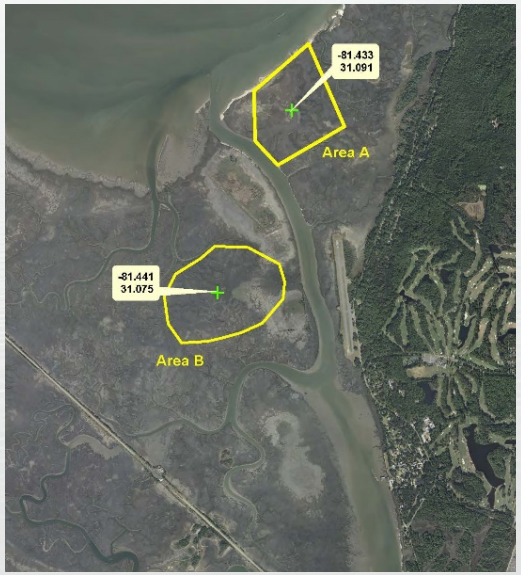
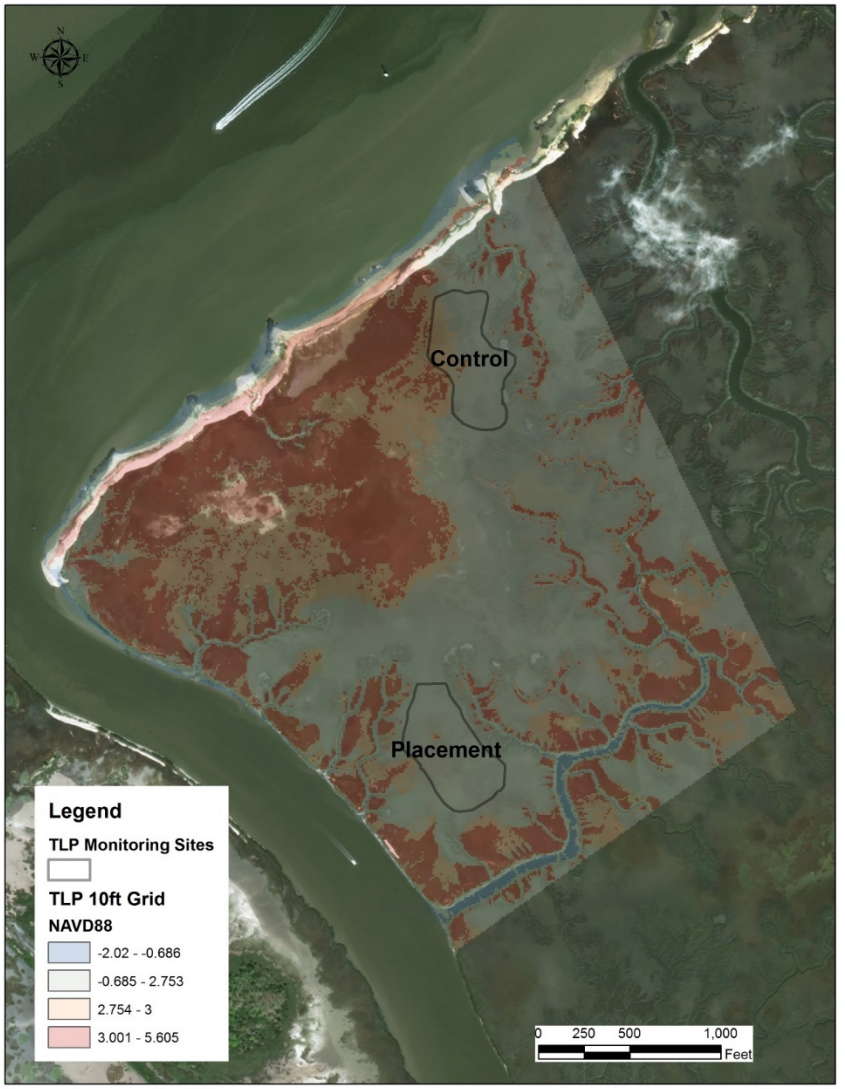
TLP

- Proposed 2 areas for 5,000 – 15,000 CY placement
- Marshes in area are generally healthy
- Eastern site: 5 acre placement and control sites
- Other considerations: elevation, material thickness, containment, small creeks, access, planting





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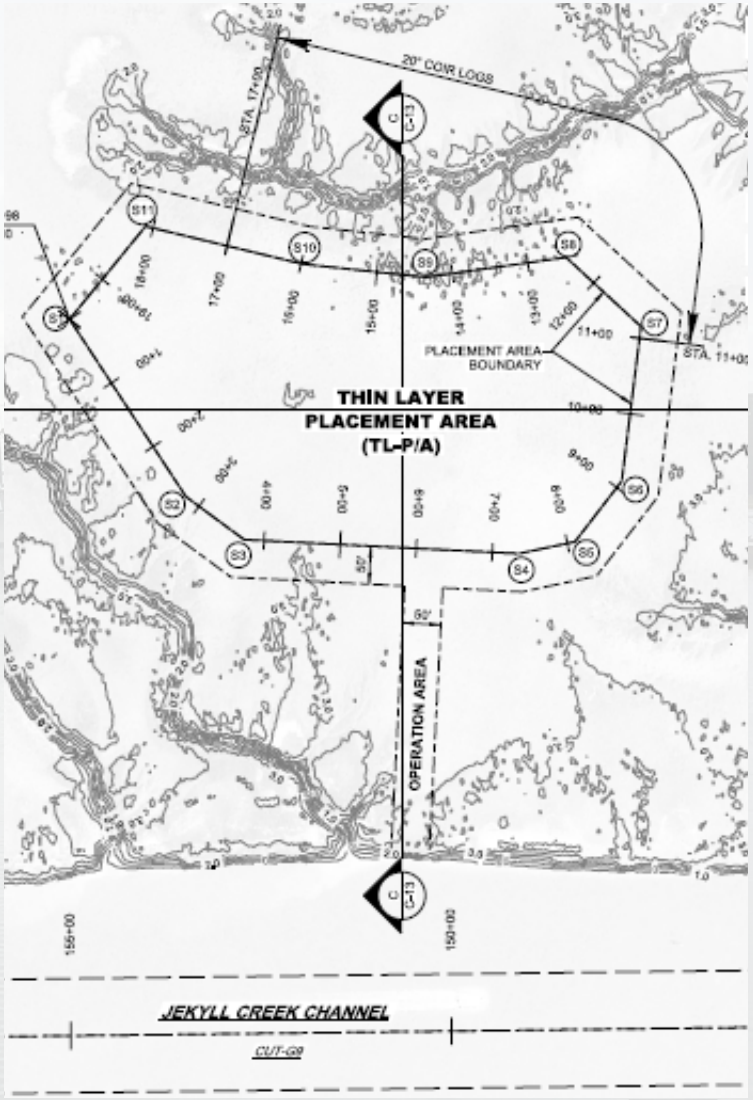
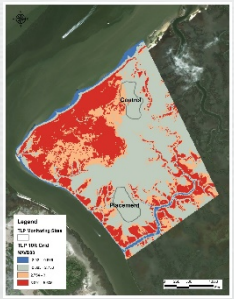
TLP

- Elevation: fill to 2.75’ – 3.0’
  - MHHW: 3.1’
  - MHW: 2.75’
  - MTL: -0.7’
  - Terrestrial LiDAR survey required to document final elevations
- Containment: coconut coir logs with untreated stakes, 50 ft construction buffer
- Creeks/tributaries: AVOIDED
- Planting: none





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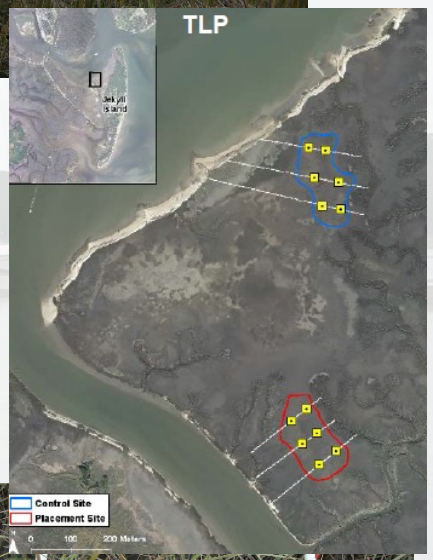
TLP Monitoring

- Cooperative Ecosystem Studies Units (CESU) – Piedmont-South Atlantic Coast
  - Christine Hladik, Risa Cohen (GSU) and Jim Morris (USC)
  - Can TLP be used to support coastal resilience and maintenance of ecosystem services in Georgia tidal marshes?
  - 2 year study:
    - Biological: stem density/height, % cover, biomass above/below, microphytobenthos abundance, invertebrate density, habitat distribution/recovery (high resolution imagery)
    - Physical: marsh elevation/range, tidal range, SLR, suspended sediment concentration, accretion rate, bulk density, flood analysis



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Partnership and Real Project Contributions ($$$!)

- GA DNR: side scan and water quality survey of open water placement site (June 2017).
  - Estimated value: $15,000
- GA DNR: Open water placement coordination, TLP site surveys/analysis (Oct-Dec 2017).
  - Estimated value: $250,000 (open water monitoring scope reductions), $100,000 (TLP site assessments)
- GA DNR: Support/coordinate imagery and elevation data for TLP monitoring.
  - Estimated value: $65,000
- JIA: Camera system purchase, installation, web display, O&M
  - Estimated value: $20,000
- TNC: Camera system purchase, installation, web display, O&M
  - Estimated value: $20,000

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Separation of Fines Study

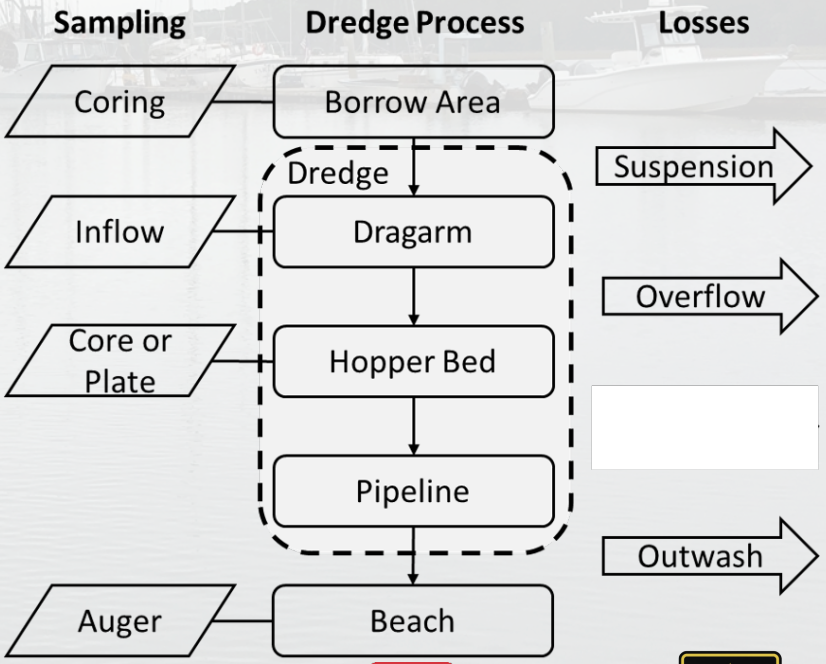
INTERAGENCY AGREEMENT BETWEEN USACE AND BOEM

OBJECTIVE:

Quantify changes in sediment characteristics (i.e., grain size, sorting) and the degree, timing, and variability of sediment sorting during dredging and placement operations to determine the extent of potential sediment coarsening to better inform sediment compatibility analyses and subsequent management of sediment resources.

STUDY IMPLICATIONS:

- Inform multi-user conflict decisions
- Potentially revisit in situ borrow allowable fine content regulations
- Potential for additional sources of sand from offshore and beneficial use sources



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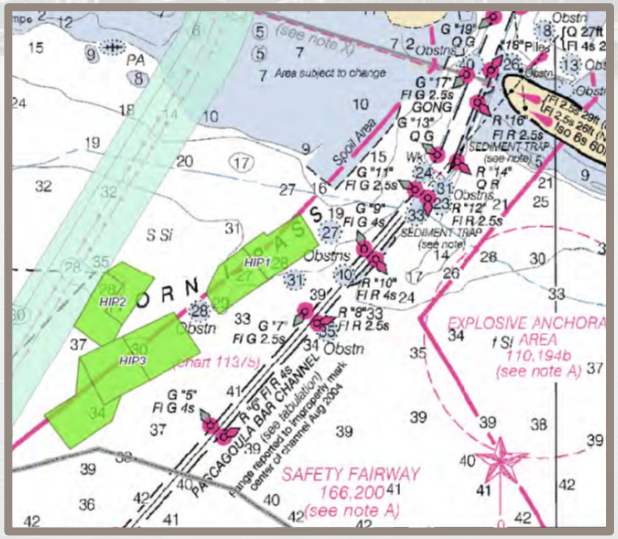
PROJECT: MsCIP Ship Island Restoration

PARTNERS: Great Lakes Dredge and Dock

DREDGE PLANT: Liberty Island



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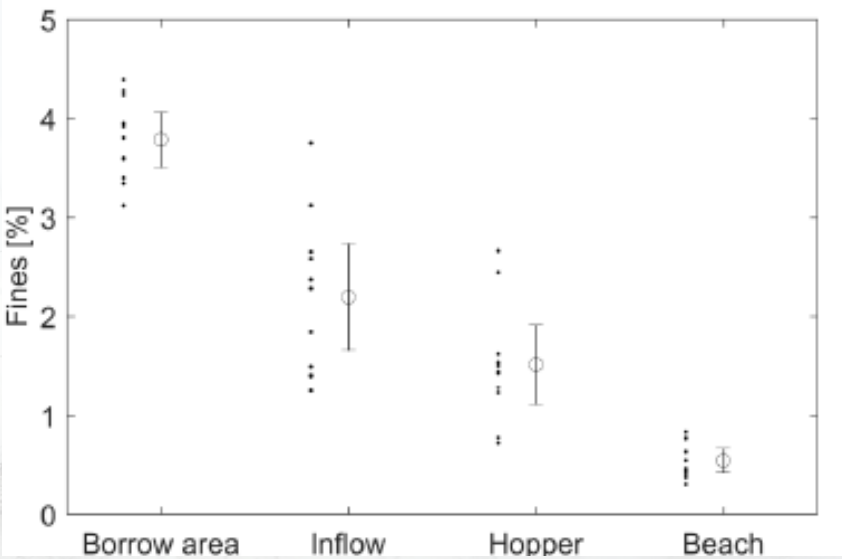
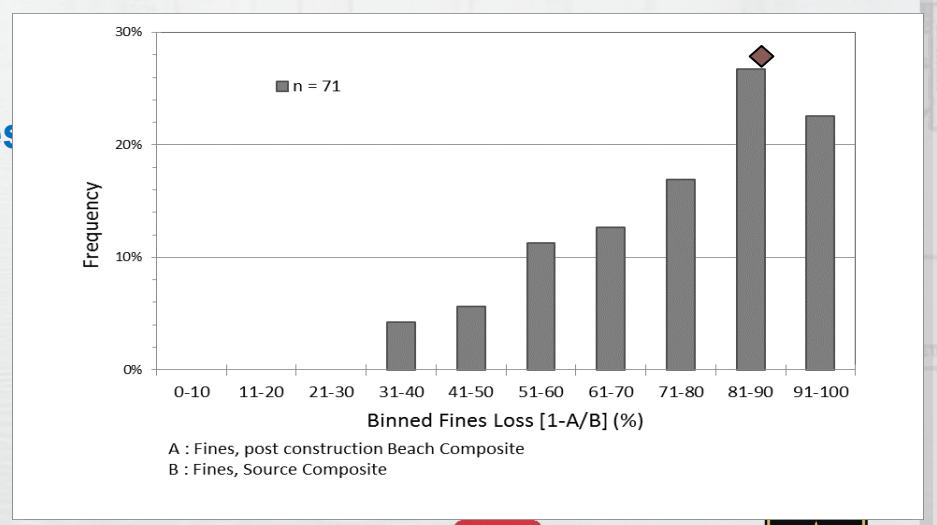
Separation of Fines Preliminary Results

- Sampled 10 loads (June/July 2018)
- Observed ~50% loss at each point
- Strong correlation between fine content and color
- Suggests most sorting occurs during loading at BA
- Final report to be completed by end of 2018



Implies we can use sources with higher fine content for beach nourishment and should continue to focus on methods and techniques to minimize impacts of fines



(Coor and Ousley)

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Thank You.

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