ERDC
Engineer Research and Development Center

FRM-EWN Collaborative Meeting
Strategic Placement of Dredged Material

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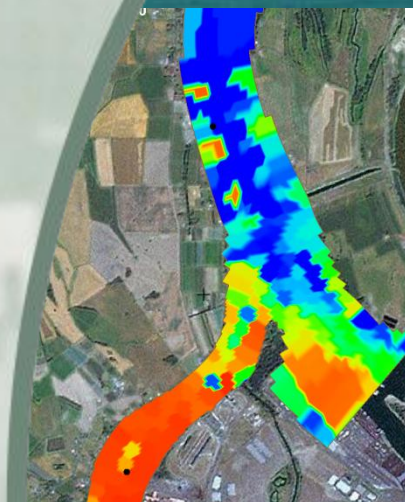

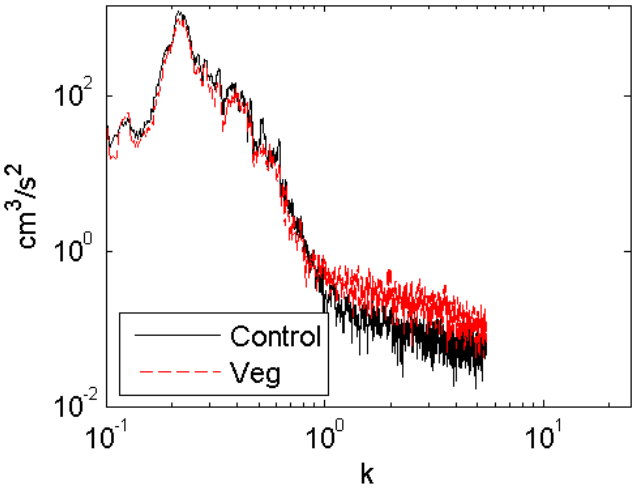

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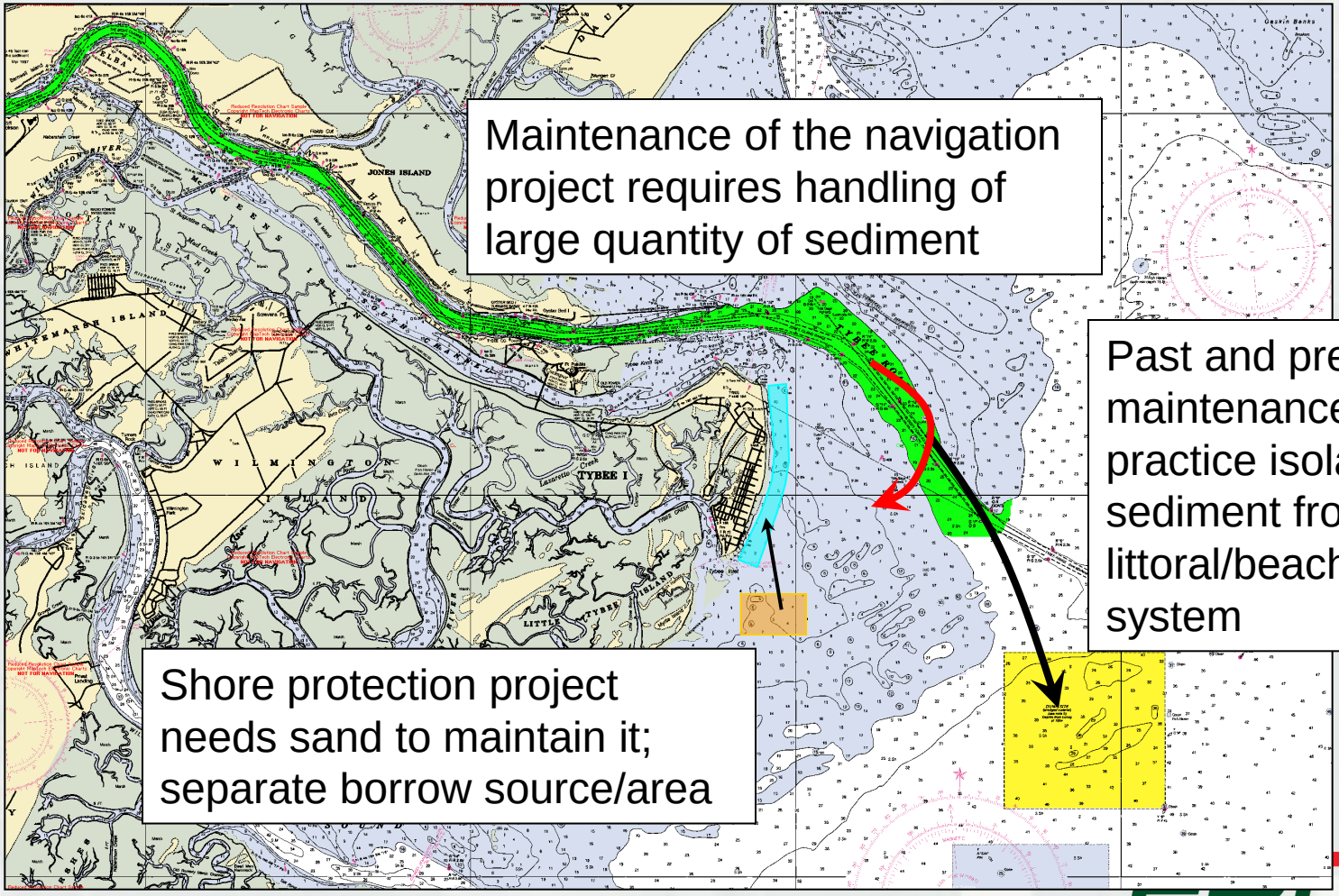
Objective

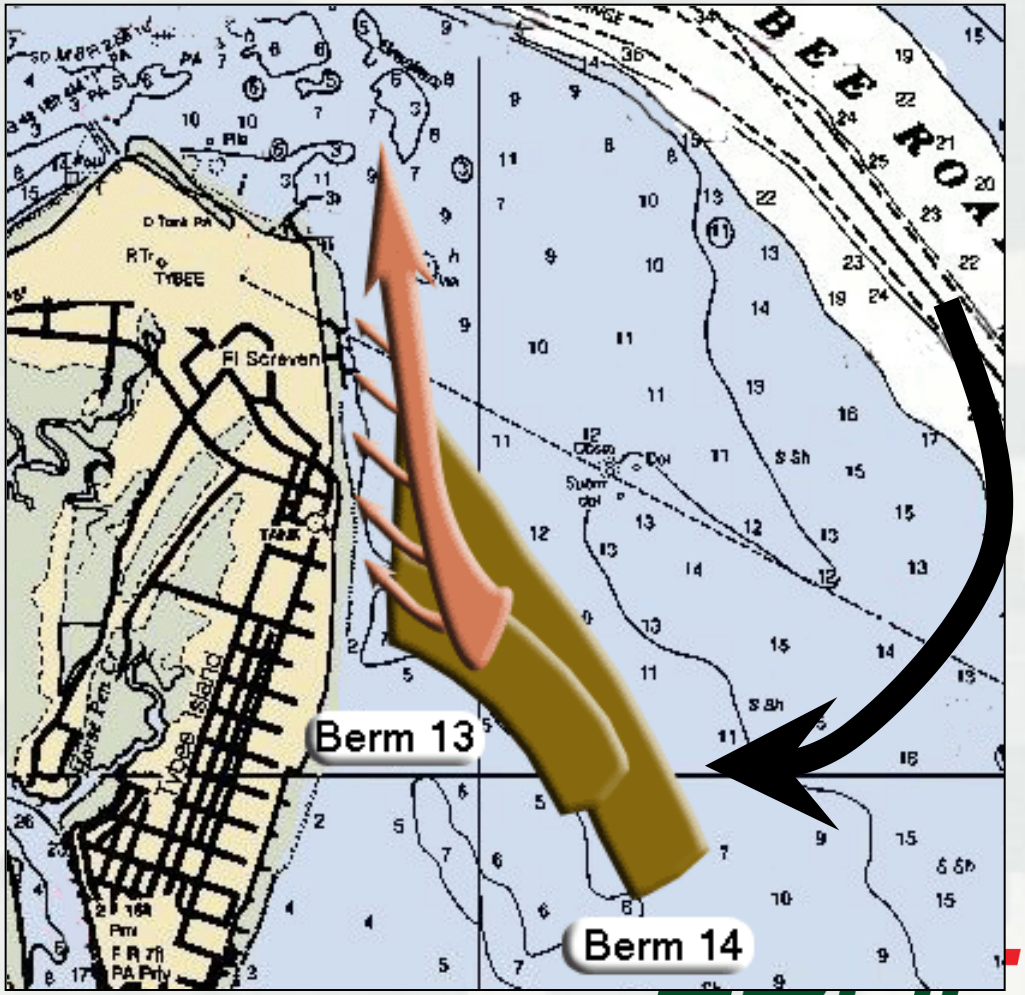
- Build appropriate tools to support application of strategic placement in diverse environments
  - ► Process Understanding
    - Dredged material placement
    - Nearshore/shallow water transport
    - Sediment interaction with nearshore features
  - ► Predictive Models and Tools
  - ► Decision Support
    - Environmental Impacts
    - Cost/Benefit

Nearshore Placement of Mixed Sediment



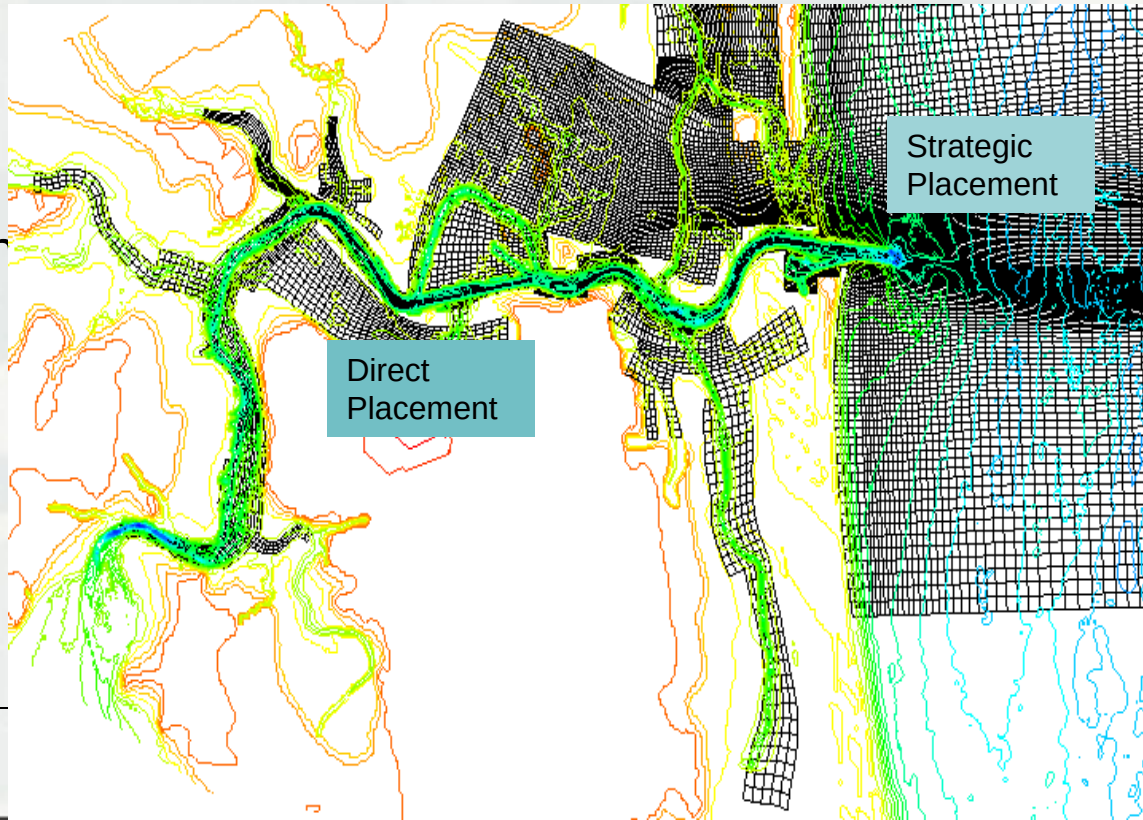
Nearshore Placement of Mixed Sediment

- Place mixed sediment from channel into nearshore berms
- Allow natural winnowing to remove fine content
- Longshore transport patterns will move sediment into north Tybee littoral zone



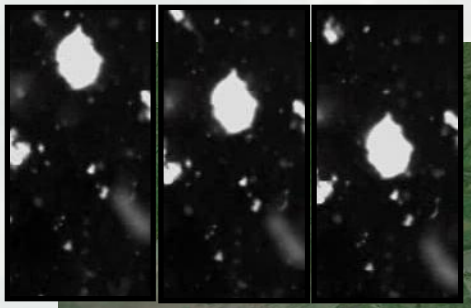
Lagrangian and Eulerian Models

- Modeling sediment transport into and through complex nearshore and wetland environments
  - ► Strategic placement for wetland development would, optimally, reduce direct placement
    - Wetland, nearshore hydrodynamic and transport processes
    - Plant/sediment interactions
- Data needed to develop descriptions
- Data for model V&V
- New process description
  - ► Transport
  - ► Primary production
- Various levels of modeling



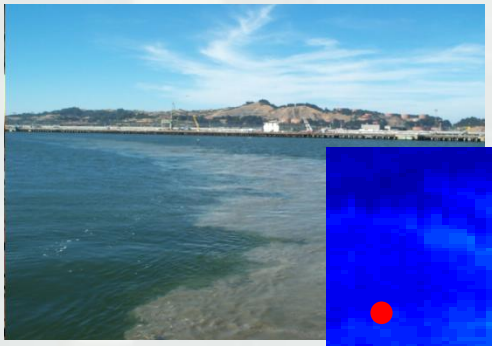
Field Monitoring of Wetland Processes

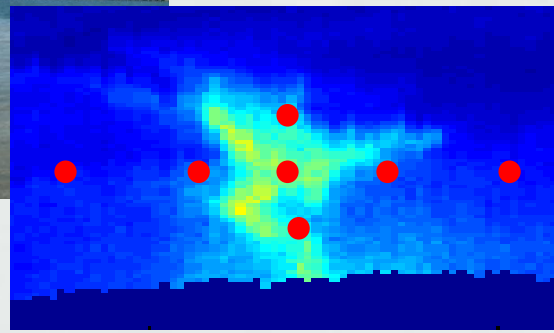
- Long-term monitoring of wetland processes
- Develop algorithms for sediment erosion, transport, settling, and deposition in vegetated environments
- Incorporate algorithms into multiple levels of predictive model
- Monitor physical, chemical and biological processes



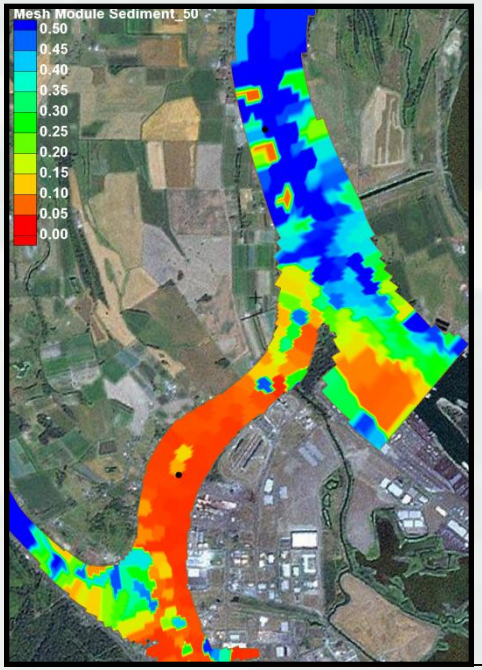
Example Approach

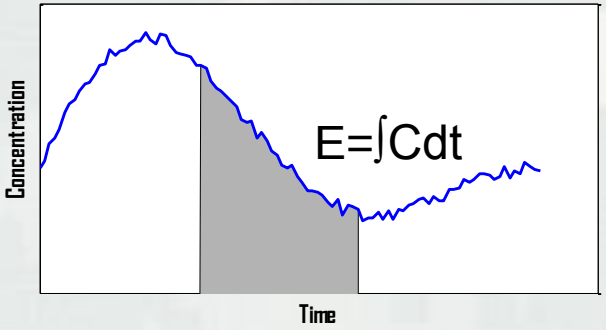
- Process Studies
  - ▸ Wave/current erosion
  - ▸ Settling/Sedimentation
  - ▸ Primary production
  - ▸ Colonization
  - ▸ Plant growth
  - ▸ Exposure/Effects





- Develop process algorithms for short to mid-term models
  - ▸ PTM
  - ▸ LTFATE
  - ▸ ADH-SEDLIB
  - ▸ STFATE/MPFATE
  - ▸ ICM





- Support wetland long-term evolution tools
  - ▸ SAND
  - ▸ SBUC
  - ▸ New SLAMM
  - ▸ Web Tools
  - ▸ Sediment Budgets
  - ▸ Exposure/Effects Tools

Support Risk, Effects, Habitat, DMMP, Feasibility Studies

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Future R&D

- Continued/Expanded monitoring collaboration with Districts
- Continue laboratory experiments
- Continue process model development
- Develop effects models
- Cost-benefit tools?