Regional Sediment Management
South Atlantic Division Optimization Pilot

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Kelly Legault, PhD, PE

RSM Regional Center of Expertise
Jacksonville District
RSM: Navigation, Resiliency

- Dredging practices often removes sediment from active sediment systems
  - Loss of sediment in riverine/estuarine systems
  - Drowning of coastal marshes, loss of buffering capacity, erosion of estuarine shorelines
  - Loss of sediment in coastal systems
  - Erosion of downdrift beaches, loss of shoreline protection

- GOAL: MAINTAIN NAVIGATION CHANNELS AND MAXIMIZE COASTAL RESILIENCY BY KEEPING SEDIMENT IN SYSTEM.
RSM: Optimization Pilot – SAD

Applied Integrated Water Resources Management

What does maximum efficiency look like in the budget?

- Federal: FRM, NAV, Eco (Federal Standard)
- Non-Federal

What are Districts doing well? Where are opportunities?

Identify challenges (R&D, policy, environmental)

Maximize use of existing data/tools and provide for:

- Transparent and defendable value dashboard & tool
- Knowledge management
IMPLICATIONS

EFFICIENCIES ARE THERE FOR THE TAKING

- +71% more project execution
- NAV execution +29%, $63.3M
- FRM execution +49%, $14.6M
- >$16.6M in regional/local value

REDUCE LONG TERM DMMA/ODMDS COSTS

THERE IS MUCH MORE LEFT ON THE TABLE

4 DEEPENINGS IN SAD, 98MCY, $2.3 B

IT’S TIME FOR A DRAMATIC SHIFT IN HOW WE BUDGET FOR PROJECTS

Telling the Story
Return on Investment
Total Dredge Volume and Value of RSM Implemented SAD NAV-FRM Projects

<table>
<thead>
<tr>
<th>District</th>
<th>*Total Dredge Volume (CY)</th>
<th>% Managed by RSM Strategies</th>
<th>Annual RSM Value ($ M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAD Total</td>
<td>62,421,600</td>
<td>49%</td>
<td>$97.3</td>
</tr>
<tr>
<td>Charleston</td>
<td>17,726,100</td>
<td>58%</td>
<td>$38.9</td>
</tr>
<tr>
<td>Jacksonville</td>
<td>10,027,000</td>
<td>53%</td>
<td>$27.6</td>
</tr>
<tr>
<td>Mobile</td>
<td>18,996,500</td>
<td>56%</td>
<td>$18.3</td>
</tr>
<tr>
<td>Savannah</td>
<td>6,572,000</td>
<td>4%</td>
<td>$0.0</td>
</tr>
<tr>
<td>Wilmington</td>
<td>9,100,000</td>
<td>48%</td>
<td>$12.5</td>
</tr>
</tbody>
</table>

*Total dredge volume calculated as the sum of all material dredged from NAV projects per dredge cycle.
### SAD Projects with $2+ Million in Annual RSM Value

<table>
<thead>
<tr>
<th>Project</th>
<th>Material RSMed</th>
<th>Annual RSM Value ($ M)</th>
<th>Primary Benefactor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charleston Harbor</td>
<td>57%</td>
<td>$37.6</td>
<td>NAV</td>
</tr>
<tr>
<td>Mobile Harbor</td>
<td>51%</td>
<td>$11.9</td>
<td>NAV</td>
</tr>
<tr>
<td>Tampa Harbor</td>
<td>70%</td>
<td>$4.5</td>
<td>Other</td>
</tr>
<tr>
<td>Pinellas Shallow Draft</td>
<td>100%</td>
<td>$4.4</td>
<td>FRM</td>
</tr>
<tr>
<td>St. Aug - St. Johns</td>
<td>100%</td>
<td>$4.2</td>
<td>NAV</td>
</tr>
<tr>
<td>Wilmington Harbor</td>
<td>29%</td>
<td>$3.8</td>
<td>Other</td>
</tr>
<tr>
<td>Morehead City</td>
<td>42%</td>
<td>$2.8</td>
<td>Other</td>
</tr>
<tr>
<td>Fort Myers</td>
<td>100%</td>
<td>$2.5</td>
<td>FRM-NAV</td>
</tr>
<tr>
<td>Pascagoula Harbor</td>
<td>65%</td>
<td>$2.5</td>
<td>NAV</td>
</tr>
<tr>
<td>Kings Bay - Nassau Co</td>
<td>28%</td>
<td>$2.4</td>
<td>NAV</td>
</tr>
<tr>
<td>Baker's Haulover-Miami Harbor</td>
<td>100%</td>
<td>$2.2</td>
<td>FRM</td>
</tr>
</tbody>
</table>
Pascagoula Harbor

- 4 Coastal Resiliency/Beneficial Use Strategies ($2.5 million annual value)
  - Shore Protection (Pascagoula Beach)
  - Wetland Creation (Singing River Island)
  - Littoral Zone Placement
  - Thin Layer Placement (Upper/Lower Sound)
Tampa Harbor

- Beneficial Use Strategy at Egmont Key ($4.5 million annual value)
- Wildlife Refuge: Shore birds, sea turtles
- National Register of Historic Places
- Lighthouse (1858)
- Used in Seminole War, Civil War, Spanish-American War
- Managed by US Fish and Wildlife Service, Florida State Parks, Coast Guard
### Regional Sediment Management (RSM) Implemented Annual Value

<table>
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<tr>
<th>Project Type</th>
<th>Implemented RSM Annual Value</th>
<th>Identified RSM Opportunity Annual Value</th>
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<tbody>
<tr>
<td>Navigation</td>
<td>$65.85 Million</td>
<td>$3.8 Million</td>
</tr>
<tr>
<td>Flood Risk Management</td>
<td>$13.05 Million</td>
<td>$5 Million</td>
</tr>
<tr>
<td>Other</td>
<td>$17 Million</td>
<td>$7.2 Million</td>
</tr>
<tr>
<td>Total</td>
<td>$95.9 Million</td>
<td>$16 Million</td>
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**Summary:**

- **$95.9M Total**

**RSM Volumes by Placement Type**
- Total Dredge
- Beach
- Nearshore
- Estuarine-Riverine

**WEB APPLICATION DEMONSTRATION**

**BUILDING STRONG®**
Scheduling Optimization
Value: ~$20 M/Yr

- Schedules are uncoordinated
- Potential for inefficient dredge plant itineraries over course of dredging year
- Results in higher dredge mobilization costs

- While accounting for Project-level requirements and environmental work windows, schedule dredging so as to minimize mobilization costs.

Dr. Ned Mitchell, USACE-ERDC
Hurricane Matthew and RSM: Nassau County

Place ~300,000 CY of beach sand annually

- Nassau County SPP
- Fort Clinch
- NAV project maintains beach
- Next scheduled placement in early 2017
- Estimated annual value of $2.4 million
Hurricane Matthew and RSM: St. Johns County

Maintained by O&M dredging of Inlet and IWW

- 80% of beach quality material from Inlet and Ebb Shoal
- $4.2 M in annual value
Thank You!
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Regional Sediment Management

### Project Dashboard

- **Select a project...**

#### Map of Florida

#### Chart Summary

**RSM Implemented Annual Value**
- **Navigation:** $4.8M
- **Flood Risk Management:** $9.9M
- **Other:** $13M

**Total:** $27.6M

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