Galveston District
2012 Beneficial Use of Dredged Material Workshop

Galveston District– 2012 Beneficial Use of Dredged Material Workshop

Custodians of the Coast

US Army Corps of Engineers

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Welcome

- Opening Remarks
- Introductions
- Agenda
- Handouts
- Administration Notes

Galveston District Regional Sediment Management (RSM) Program Update

Tricia Campbell, P.E.
Operations Manager

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Background of SWG's RSM Program

- Organization
- Funding process
- Proposals

FY12 SWG RSM Projects

- Received funding for two projects
  - Matagorda Bay RSM
  - Upper Texas Coast Regional Sediment Budget

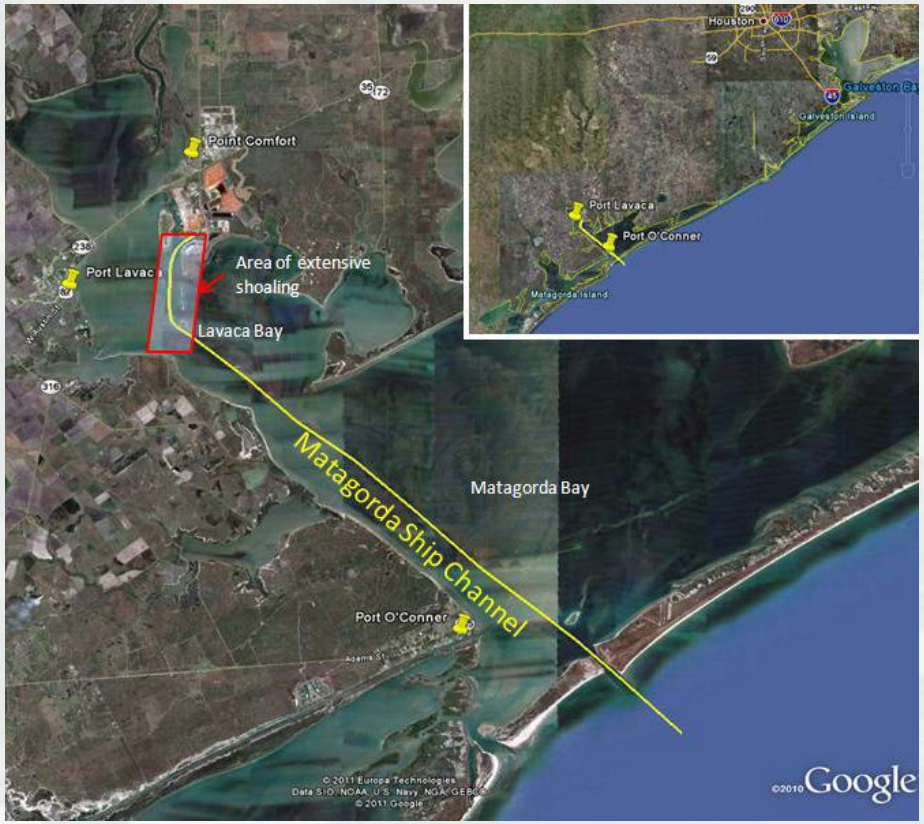
Galveston District FY12 RSM Projects
Matagorda Bay RSM

Description/Challenge

- Area of Extensive Shoaling in Matagorda Ship Channel
- Annual Draft Restrictions = Annual Dredging Requirements
- Limited Funding for Dredging

Goals/Issues to Address

- Determine source of sediment
- Develop alternatives to reduce the deposition of sediment into the ship channel
- Implement alternative(s) which can effectively reduce shoaling and provide increased time between dredging cycles



BLUF: Implementation of alternatives which can reduce shoaling in the Matagorda Ship Channel will benefit deep draft ports, industry, and USACE by enabling SWG to more effectively manage the maintenance of the channel in order to ensure reliable deep draft navigation.

Galveston District FY12 RSM Projects
Matagorda Bay RSM

PDT Members

SWG
- Tricia Campbell, Operations Manager
- Sheri Willey, Planning Lead
- Samantha Lambert, Hydraulic Engineer
- Andrew Smith, Civil Engineer

ERDC
- Robert Thomas, Research Hydraulic Engineer
- Lihwa Lin, Research Hydraulic Engineer
- Honghai Li, Research Physical Oceanographer

Who could benefit?

- Ports of Point Comfort, Port Lavaca, Port O'Conner
- Calhoun County Port Authority

Leveraging/Collaborative Opportunities

funding, data, tools, models, etc
with Other Projects, Programs, Partners, etc

- CIRP
- DOER
- Existing models

Milestones/Deliverables

- Sediment Budget, 6/30/12, 100%
- Model Calibration, 4/6/12, 100%
- Selection of Alternatives, 5/2/12, 100%
- Testing of Alternatives w/ Refined Model, 6/15/12, 100%
- Report, 9/30/12, 100%
- Coordinate implementation of solutions (FY13)

Galveston District FY12 RSM Projects
Matagorda Bay RSM

Approach

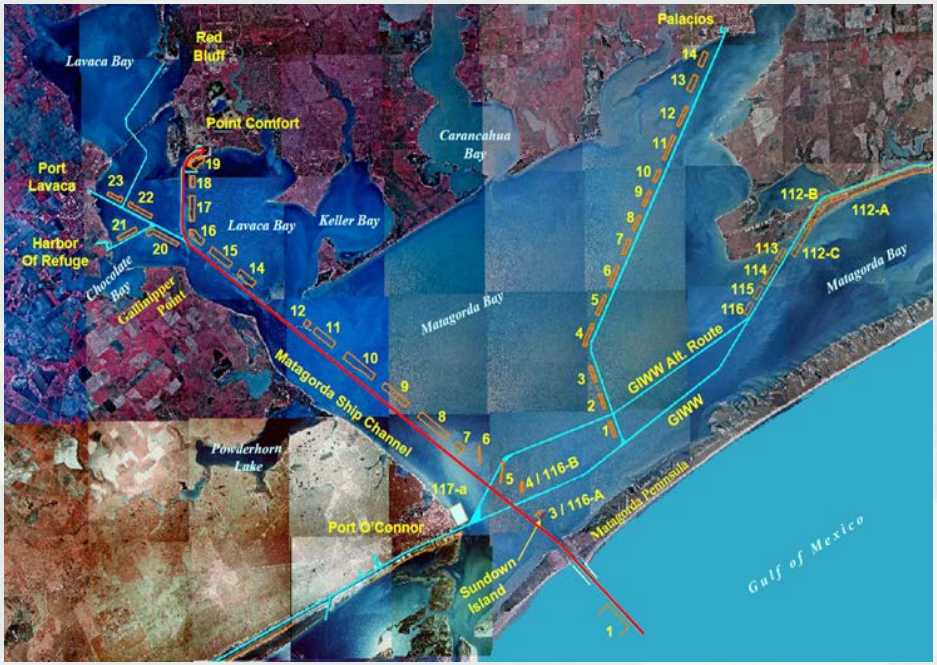
- Data search and review
- Gathered condition surveys for modeling
- Modeling performed for currents, sediment movement, and fluid mud
- Calculated sediment volume placed into open water placement areas adjacent to the channel
- Developed sediment budget in SBAS
- Identified alternatives and modeled to see which was most effective

Models, Tools, Databases, etc Used

- Past Reports,Studies
- Dredging History Database
- Condition Surveys
- CMS Modeling for Currents, Sediment and Mud and Alternatives
- SBAS Sediment Budget

Benefits to O&M, FRM, Environmental

- Hopefully will solve shoaling problem in upper reaches (save money).
- Have a better understanding of how sediment moves in system.
- Find opportunities for future RSM studies in area.



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Galveston District FY12 RSM Projects

Matagorda Bay RSM

Opportunities to take action:

move/optimize sediment
Improve efficiencies

- Alternative to relocate PA's to west side of channel in upper reach
- Fluid mud is an issue – important to find better ways to measure nautical depth.
- Opportunity to use geotube or build a wall adjacent to channel in high shoaling area (historically used geotube successfully between PA's 18 and 19)
- Looked at fully contained beneficial use area

Accomplishments

- Verified shoaling in upper reaches of MSC was problematic with survey data, dredging history database data and modeling
- Developed alternatives and modeled to see which worked best
- Developed sediment budget for Matagorda bay system which will be useful for any future projects in the area

Volume of Sediment Moved

- Known quantities in channels from Dredging History Database.
- Several Unknown Quantities:
- Amount re-circulating from PA's is unquantified. (Estimated 10% in lower MSC and 20% in upper reaches). Could be higher.
- Amount of fluid mud (Assumed 20 to 30% of sediment in cell below moves upstream)
- Amount of sediment flowing into channel from bays

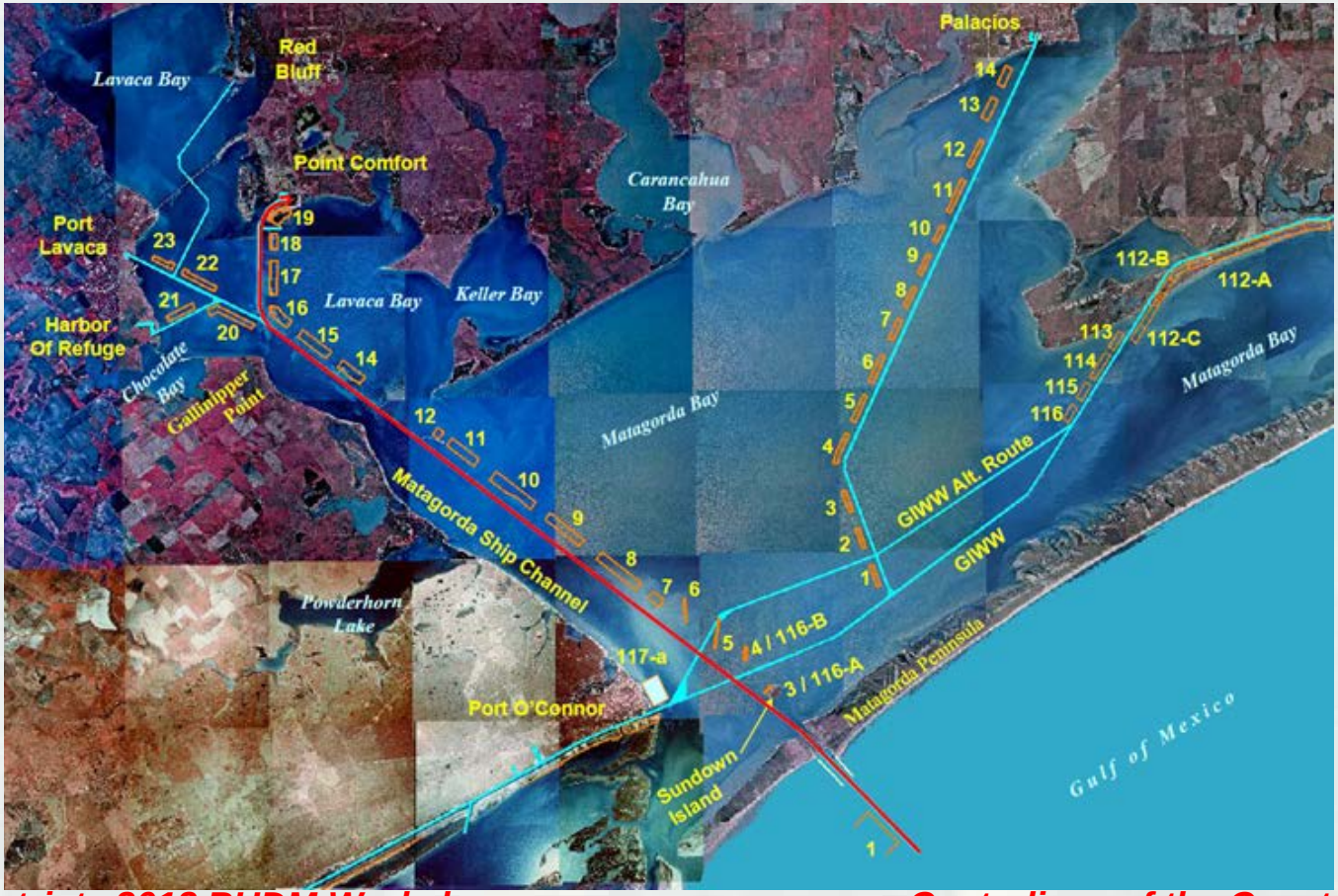
Lessons Learned

- Dredging History Database Incomplete….lots of questions when looking through data.
- Only had condition surveys (no before and afters) so it was hard to tell when dredging actually occurred. May have impacted CMS analysis.
- Lots of unknowns…more studies are needed to better identify the "quantities" for the source materials in the sediment budget.

Galveston District FY12 RSM Projects
Matagorda Bay RSM

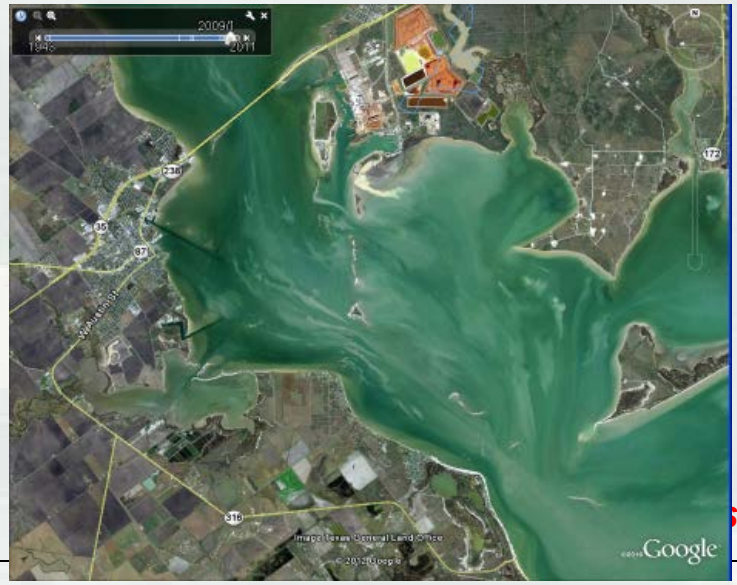
Site Overview

•Present Configuration of Matagorda Ship Channel (MSC), 200’ wide, 36’ deep, was built in 1962.

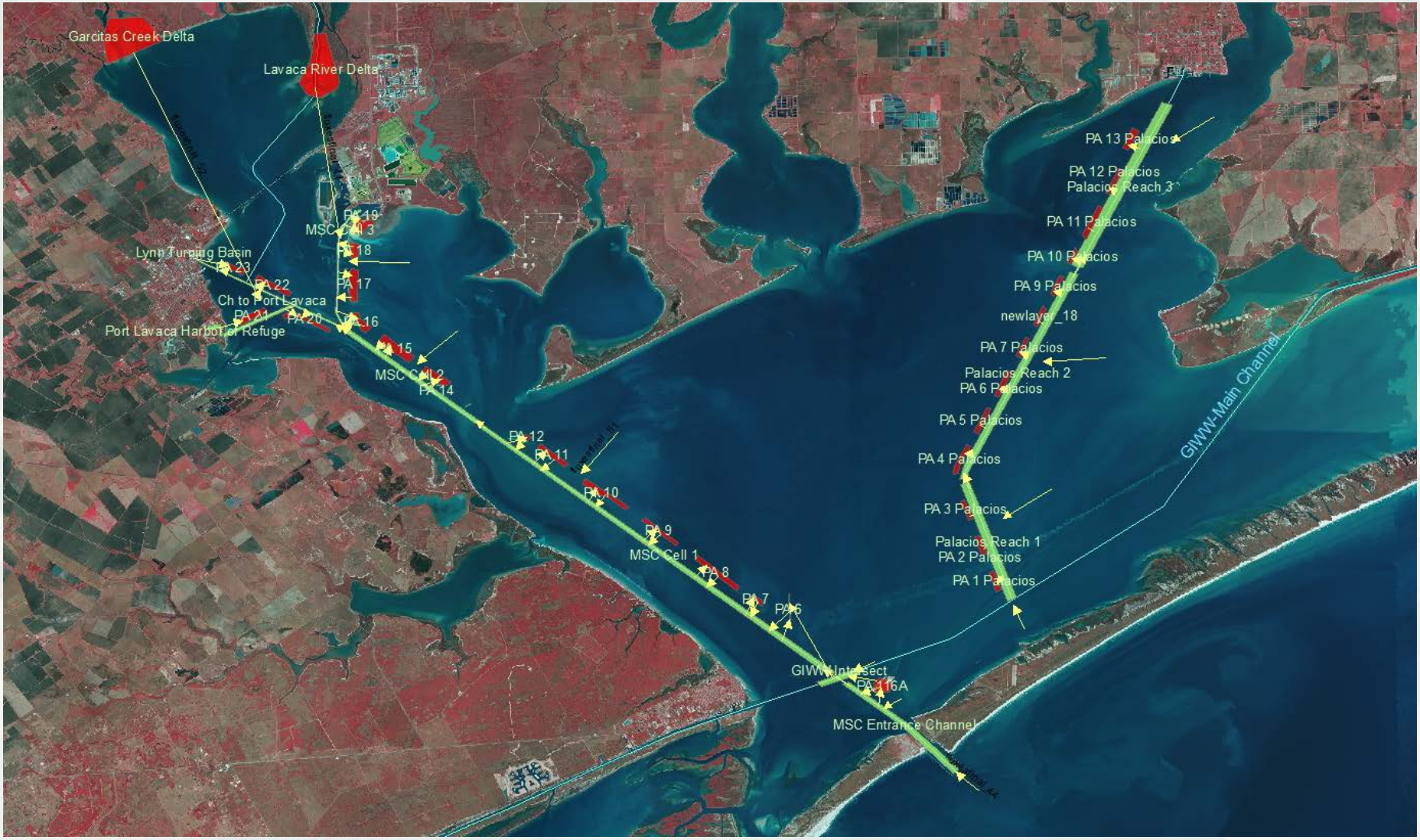


Galveston District FY12 RSM Projects
Matagorda Bay RSM

Problem Area

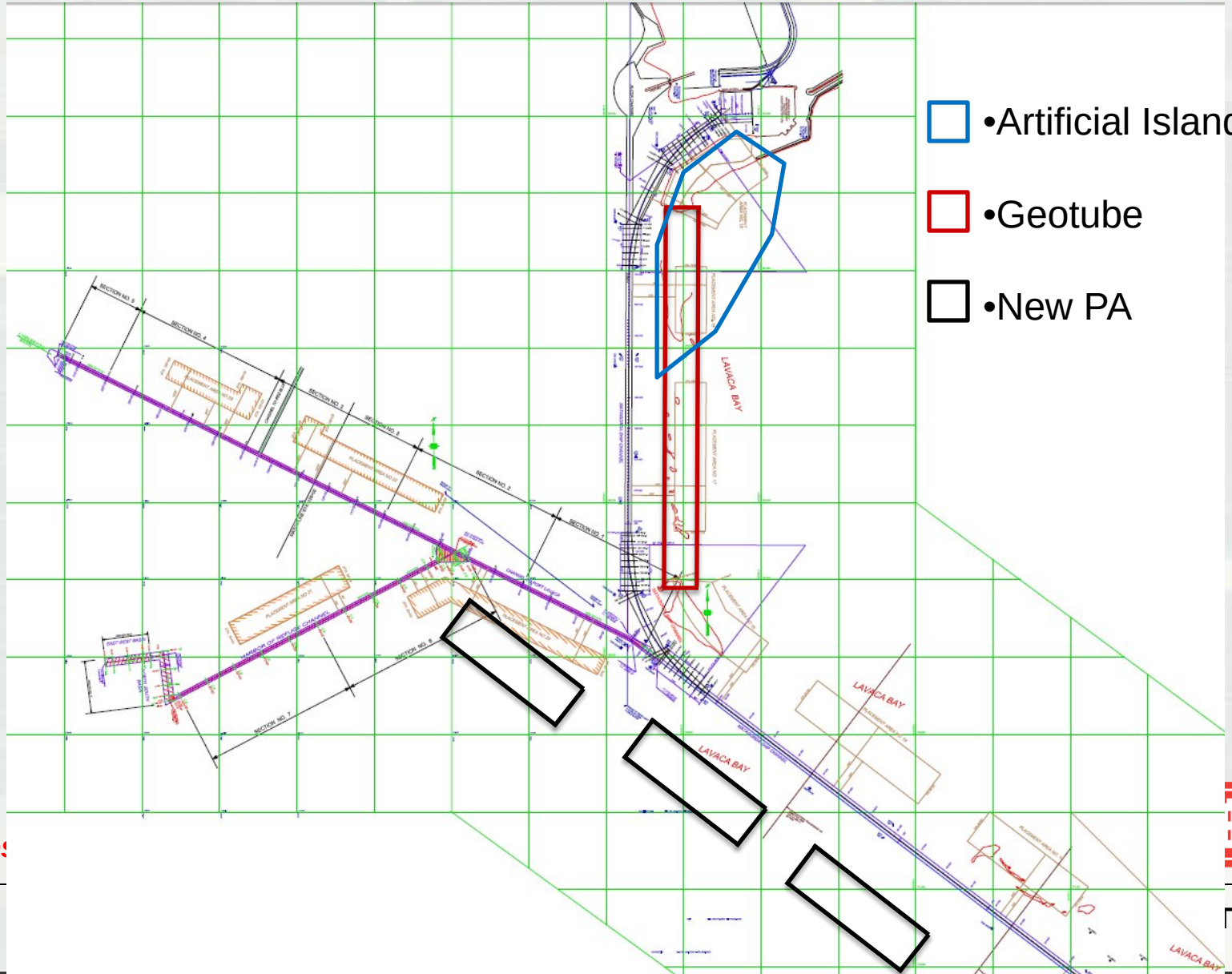


Galveston District FY12 RSM Projects
Matagorda Bay RSM
Sediment Budget (SBAS)



Galveston District FY12 RSM Projects
Matagorda Bay RSM

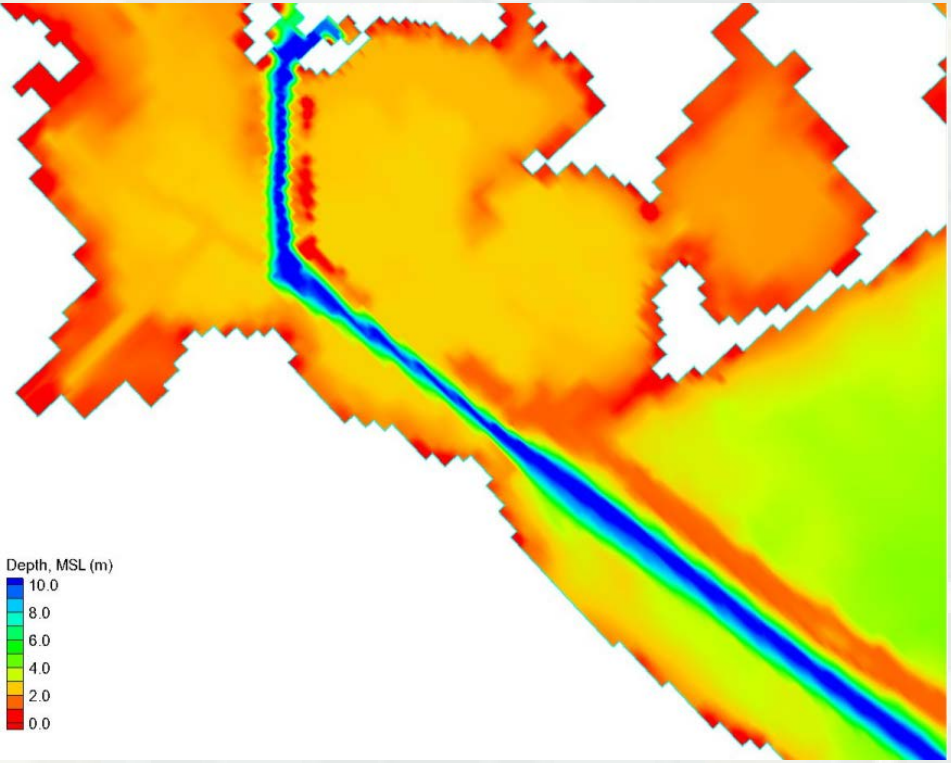
Alternative Identification

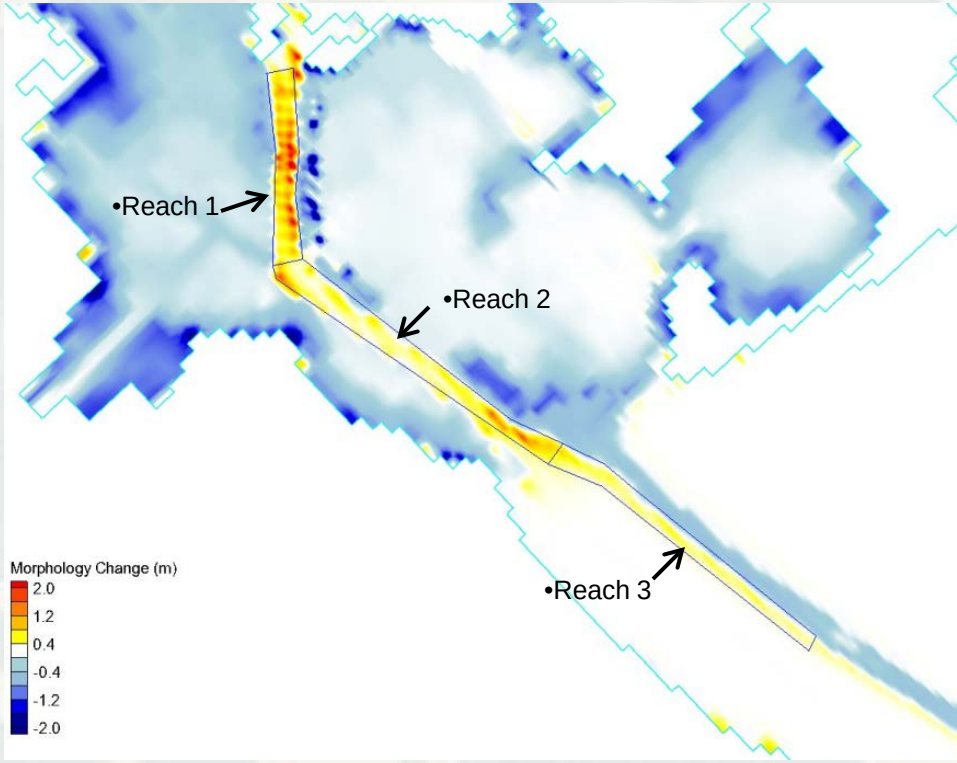


Galveston District FY12 RSM Projects
Matagorda Bay RSM

Morphology Change

•Existing Condition - Sep 2006 to Feb 2007





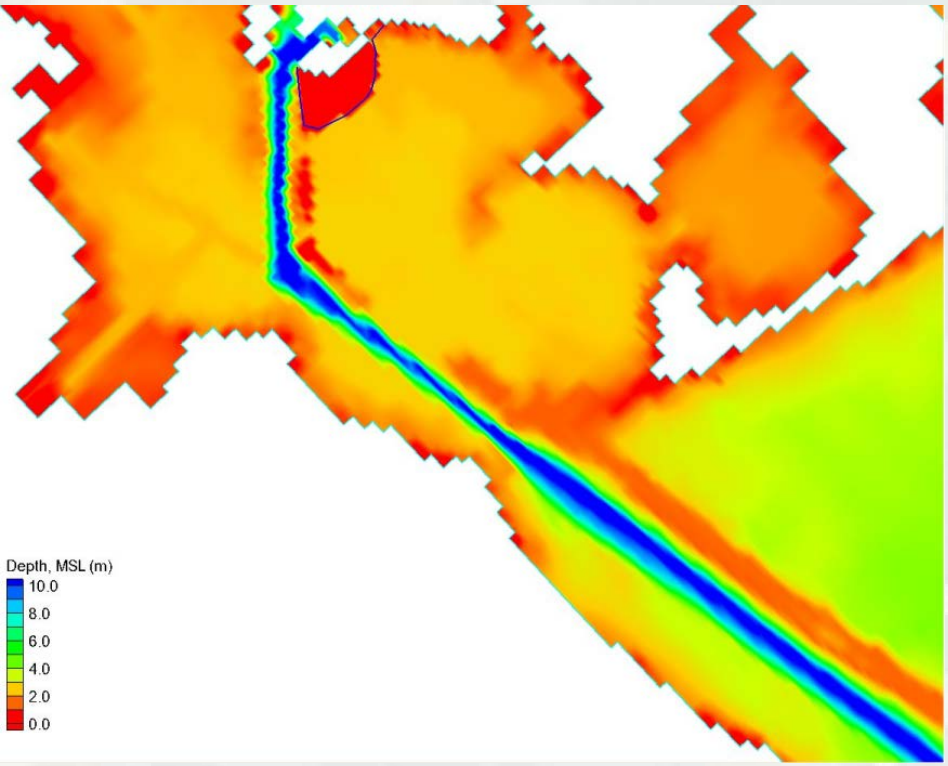
•Initial depth

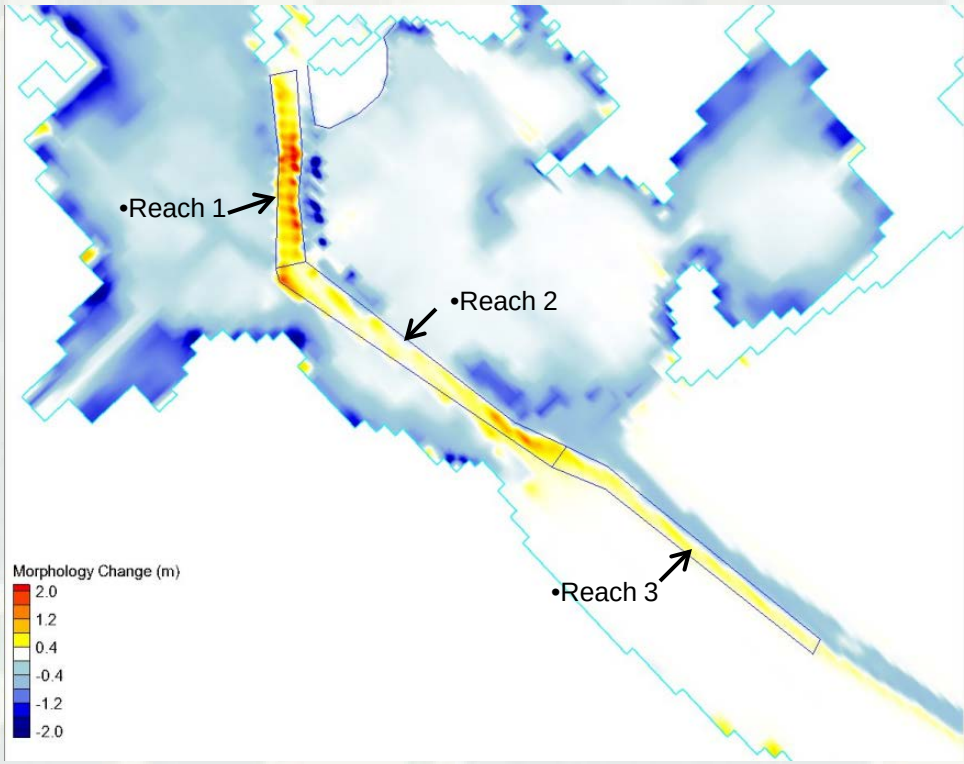
Cumulated depth change

Galveston District FY12 RSM Projects
Matagorda Bay RSM

Morphology Change

•Alt 1: Artificial Island - Sep 2006 to Feb 2007



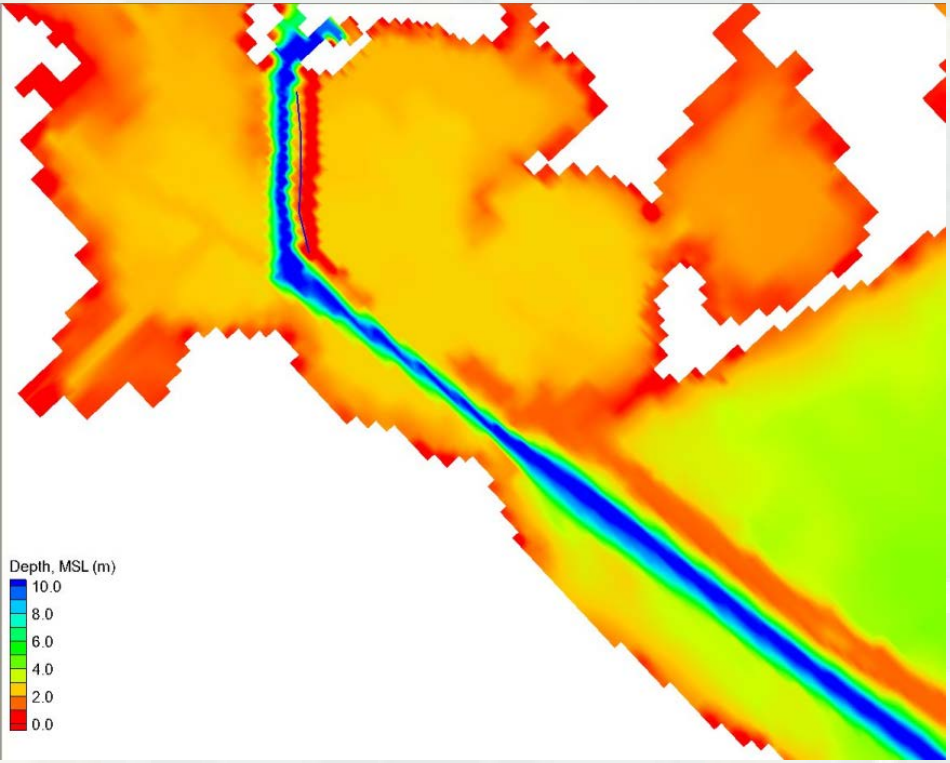


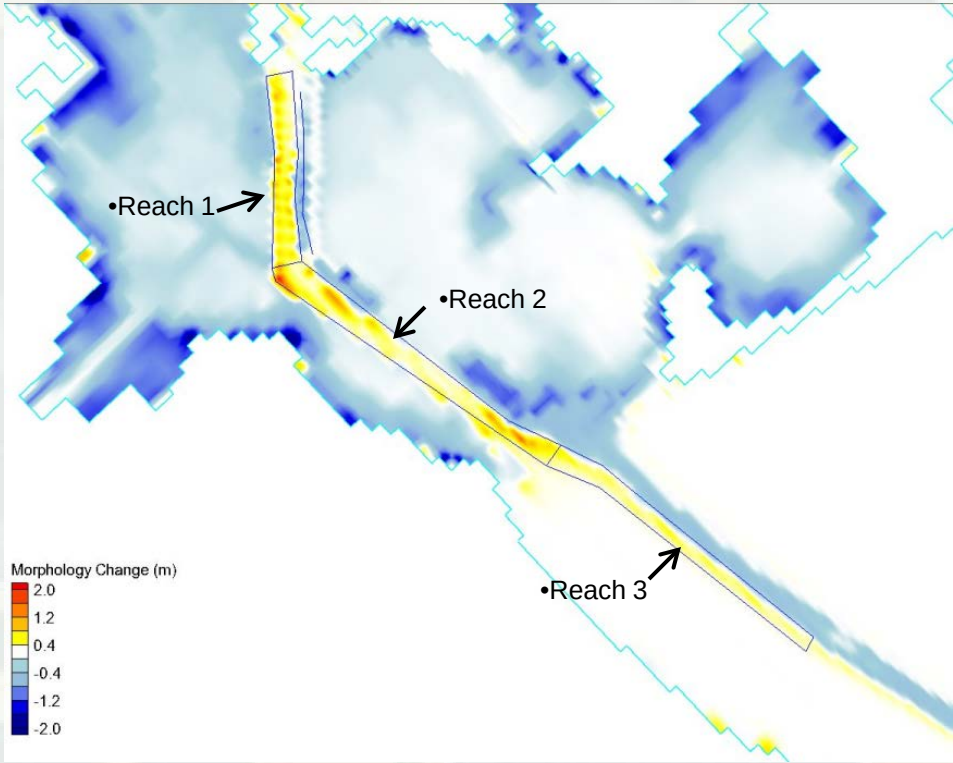
•Initial depth

Cumulated depth change

Galveston District FY12 RSM Projects
Matagorda Bay RSM
Morphology Change

•Alt 2: Geotube - Sep 2006 to Feb 2007





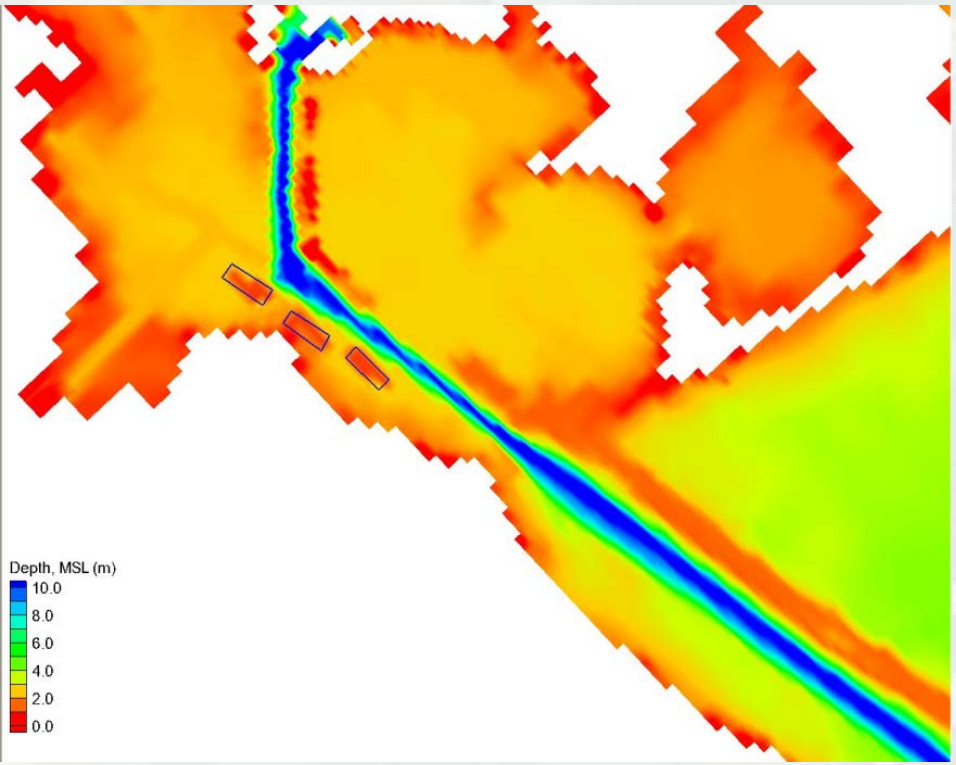
•Initial depth

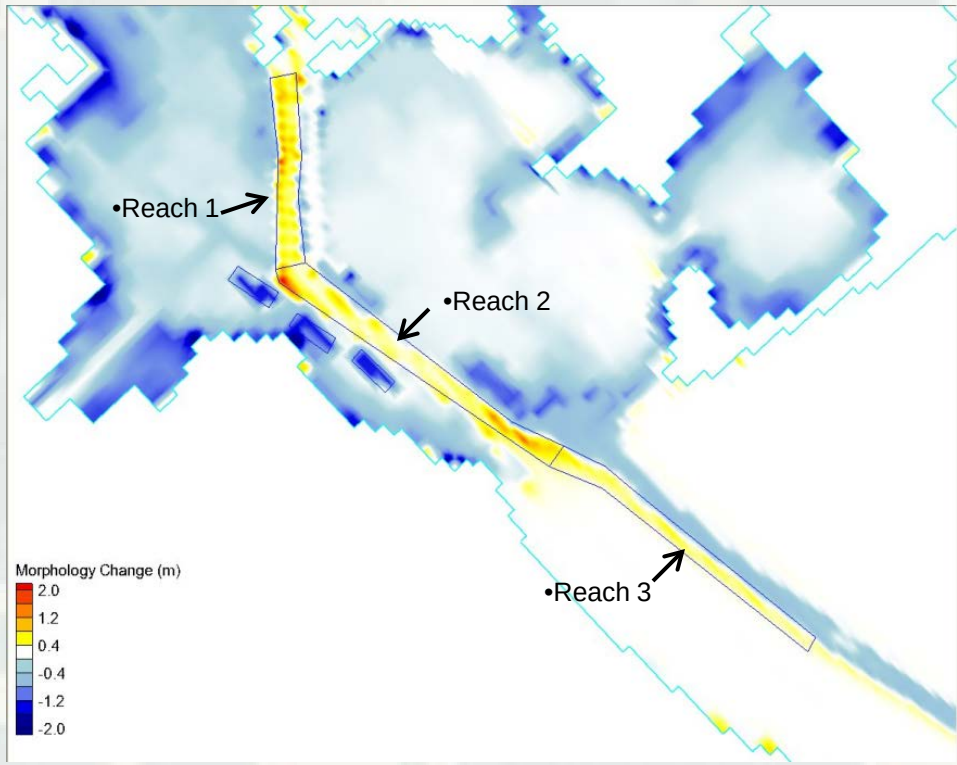
Cumulated depth change

Galveston District FY12 RSM Projects
Matagorda Bay RSM

Morphology Change

•Alt 3: 3 New PAs - Sep 2006 to Feb 2007





•Initial depth

Cumulated depth change

Galveston District FY12 RSM Projects
Matagorda Bay RSM

Calculated Sediment Volume Change

•Cumulated Sediment Volume Change (cubic yard), Sep 2006 – Feb 2007

Configuration	Reach 1	Reach 2	Reach 3	Reach 1-3	% Reduction
Existing	2.04	1.33	0.47	3.84	
Artificial Island	1.90	1.24	0.44	3.58	-7
Geotube	1.00	1.44	0.41	2.85	-26
3 New PAs	1.10	1.35	0.44	2.89	-25

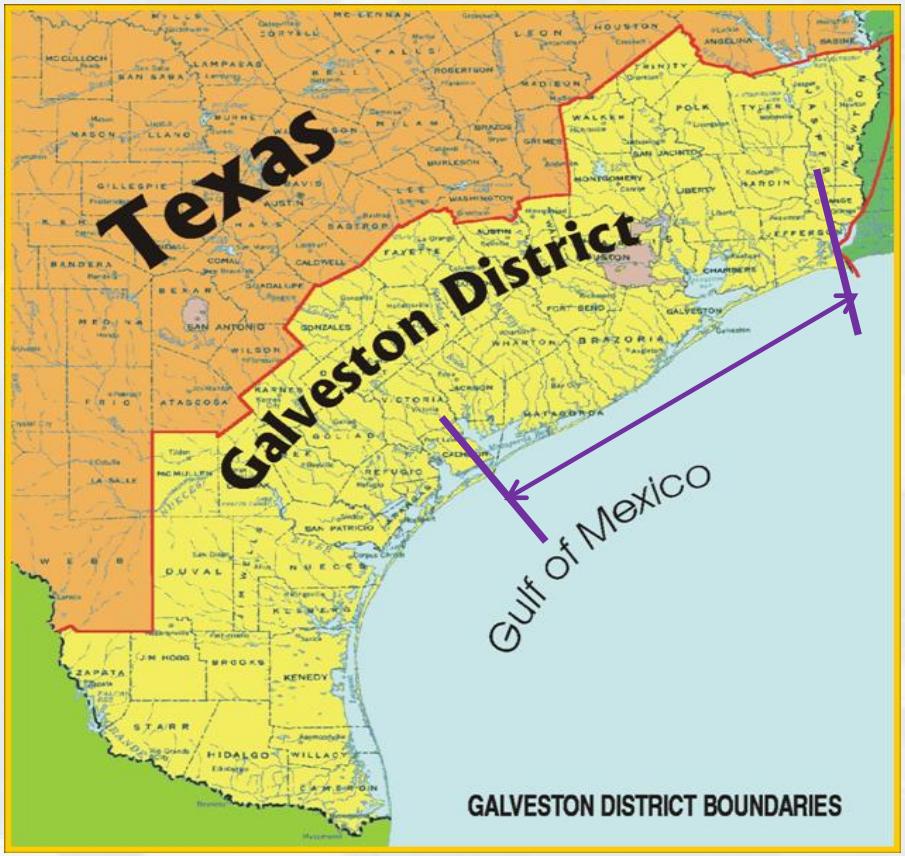
Galveston District FY12 RSM Projects
Upper Texas Coast Sediment Budget

Description/Challenge

- Create regional sediment budget for Upper Texas Coast from the Sabine River to Pass Cavallo using existing data.
- Challenges: Data not all in one place, Data gaps

Goals/Issues to Address

- Goal 1: create regional sediment budget
- Goal 2: identify sources of sediment
- Goal 3: make data available to USACE personnel as well as local agencies/sponsors



BLUF: SWG will gain a better understanding of the movement of sediment along the Upper Texas coast, allowing us to look at impacts of future projects on a regional versus local scale. It will also provide a centralized location to access information.

Galveston District FY12 RSM Projects
Upper Texas Coast Sediment Budget

District PDT Members

SWG
- Tricia Campbell, Operations Manager
- Sheri Willey, Planning Lead
- Samantha Lambert, Hydraulic Engineer
- Eduardo Irigoyen, Operations Manager

ERDC
- Robert Thomas, Research Hydraulic Engineer
- David King, Research Hydraulic Engineer
- Andrew Morang, Research Hydraulic Engineer

Who could benefit?

- Sponsors/Agencies along TX coast that desire sediment for projects (Texas General Land Office, Texas Parks and Wildlife, project sponsors)

Leveraging/Collaborative Opportunities

funding, data, tools, models, etc
with Other Projects, Programs, Partners, etc

- Sabine Pass to Galveston Bay Feasibility Study

Milestones/Deliverables

- Compile existing project studies into one regional sediment budget, 9/7/12,100%
- Gather additional information/data, 9/14/12,100%
- Final Report, 9/30/12 ,100%

Galveston District FY12 RSM Projects
Upper Texas Coast Sediment Budget

Approach

- Collect info from existing sediment budgets
- Collect data for gaps (includes modeling with GENESIS in select locations…i.e. San Luis Pass to Freeport)
- Combine existing budgets together and fill in data gaps to form comprehensive sediment budget

Models, Tools, Databases, etc Used

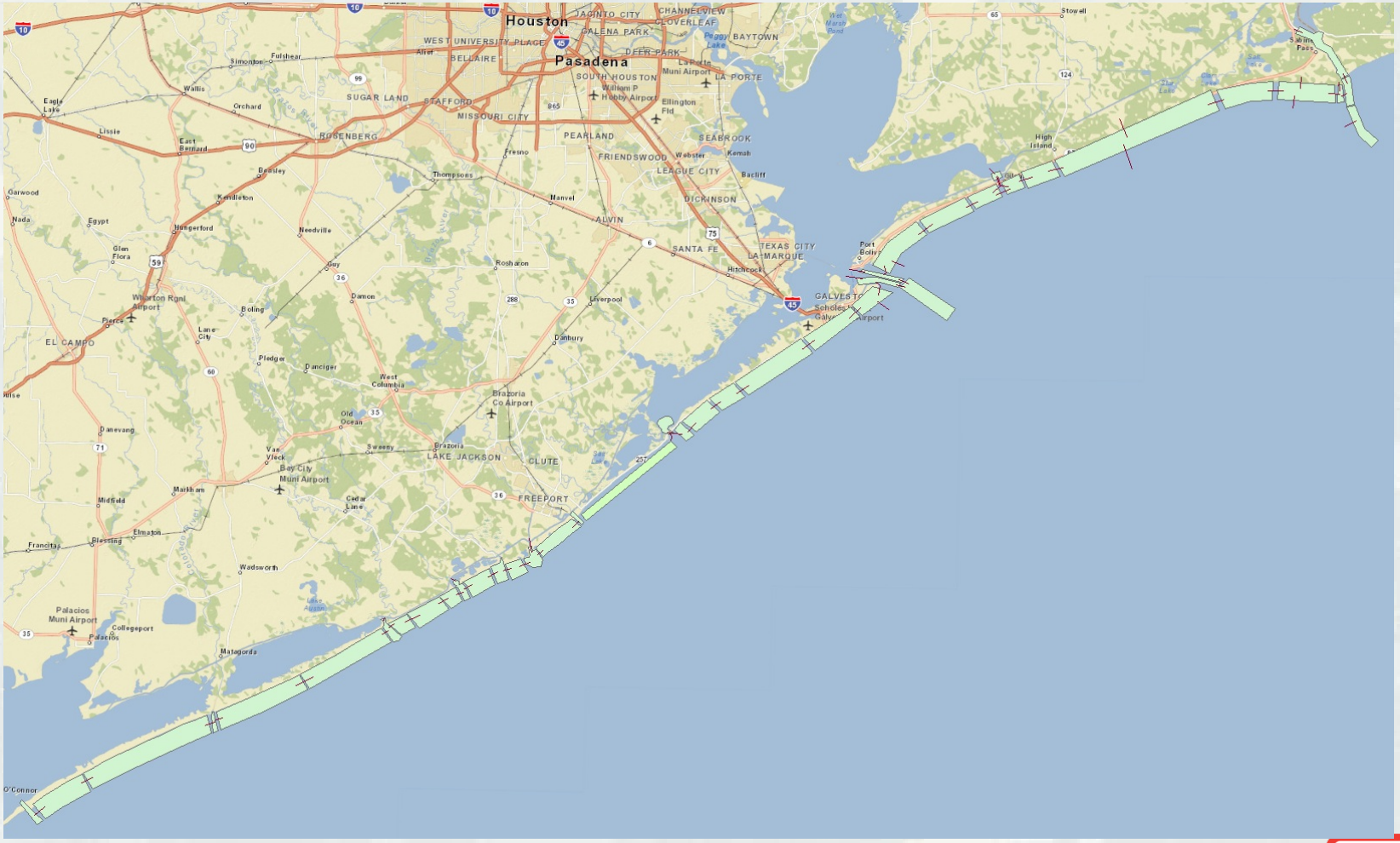
- SBAS Sediment Budget Tool
- Genesis Modeling
- BEG Texas Shoreline Change Project Data

Benefits to O&M, FRM, Environmental

- Useful in identifying future project needs and to assist with any projects along northern portion of the Texas coastline
- In conjunction with an ongoing feasibility study (Sabine to Galveston) – this information will be very useful

Galveston District FY12 RSM Projects
Upper Texas Coast Sediment Budget

Sediment Budget Cells



Galveston District FY12 RSM Projects
Upper Texas Coast Sediment Budget

Opportunities to take action:

Move/optimize sediment
Improve efficiencies

- Opportunity to use the results from this study for the Sabine to Galveston Feasibility study

Accomplishments

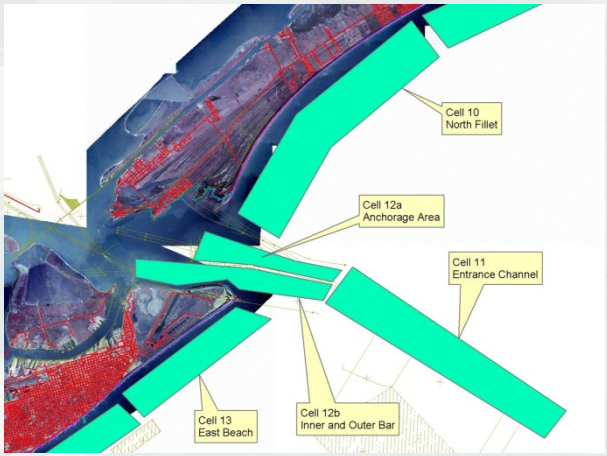
- Will have a sediment budget for Upper TX Coast
- Will have a way to inform sponsors, partners, and agencies of source and quantities of materials that they may wish to utilize in the future for their own projects

Lessons Learned

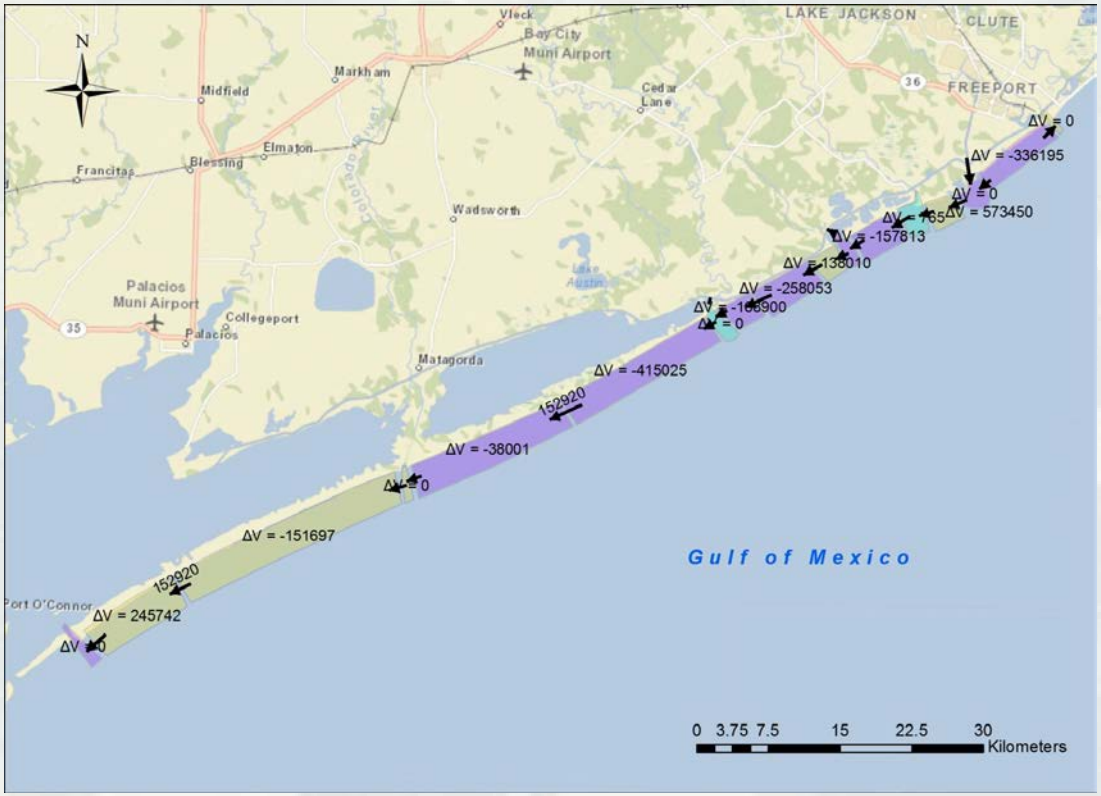
- Coordination difficult because several people are involved and are at different locations
- When combining budgets in SBAS there is not yet a way to simply combine budgets together – data has to be re-entered.

Galveston District FY12 RSM Projects
Upper Texas Coast Sediment Budget

Examples from Sediment Budget



Galveston Entrance Channel



Freeport to Port O Conner

FY13 SWG RSM proposals

- Submitted two proposals:
  - GIWW (receiving funding)
  - Galveston (pending available selection and funding)

Galveston District FY13 RSM Projects
Gulf Intracoastal Waterway RSM

Description/Challenge

- PAs experiencing erosion due to currents, wind generated waves, and ship wakes
- As semi-confined placement areas erode, breaches occur allowing sand and silt from West Galveston Bay to pass through and deposit in channel
- Due to funding restraints, dredging of GIWW limited to most critical areas

Goals/Issues to Address

- Locate and review any existing models
- Develop & test alternatives to reduce the deposition of sediment into the waterway
- Implement alternative(s) which can effectively minimize erosion and reduce shoaling

BLUF: SWG needs to identify sediment management options to prevent erosion of GIWW Placement Areas. Successful options would benefit SWG by preventing material in the placement area from eroding and migrating into the GIWW as well as increasing placement area capacity.

Galveston District FY13 RSM Projects
Galveston RSM (pending selection)

Description/Challenge

- Limited Funding for Dredging and Placement Area maintenance
- Galveston supports three major ports critical to the Nation's economy

Goals/Issues to Address

- Review Coastal Processes and develop potential solutions
- Analyze potential solutions
- Recommend future maintenance practices or studies

BLUF: Finding alternatives that could potentially keep the sand/silt material in suspension, on adjacent beaches, or otherwise out of the Federal channel while increasing the dredging cycle of the channel would benefit SWG by enabling the district to stretch its funding and help to maintain the other requirements of the Galveston project.

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Conclusion

- Working to develop and implement alternatives which can positively impact District Projects and create ways to more efficiently manage dredged material
- Working to manage material in a systems in a system approach

Questions?