FY18 RSM IPR SWG – Channel to Victoria BU Utilization Investigation POC: Steve Howard



BLUF: Development of an alternative approach to managing dredged material in the GIWW, Channel to Victoria (CTV) by assessing impacts of utilizing BU sites adjacent to the channel.

Challenges

- Quantify benefits
- Balance missions of difference agencies

Objective

- Leverage historic or previously identified BU sites.
- Determine potential impact on channel shoaling rates and design components.
- Reducing the cost of dredging while creating/enhancing habitat



FY18 RSM IPR SWG, CTV BU Utilization Approach





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Task 1: Gather Data

- Gather existing and historical data for BU sites
- Format data for entry into database
- Determine sites to assess

Task 2: Review Coastal Processes and Develop Potential Living Shorelines

- Create a database of site conditions for BU sites
- Identify materials for living shorelines using site specific conditions
- Use SBAS to create a sediment budget based on data from Task 1

Task 3: Analyze Impacts of BU Sites/Living Shoreline to the Channel

- Develop and apply CMS Model to determine benefits of living shoreline
- Identify configuration with least cost that will entrain sediment away from CTV and establish critical habitat
- Use CMS modeling results to validate design recommendations in task 2

Task 4: Cost Analysis

- Develop rough order of magnitude
- Determine a benefit cost ratio for each design recommendation





District/Other USACE PDT Members

- Steve Howard, SWG CCSC OM
 - Paul Hamilton, SWG H&H
 - Lihwa Lin, ERDC
- Robert Koch, SWG Cartographer
- Marcus Gruver, SWG Cartographer
- Ashton Burgin, SWG Operations
- Adam Tallman, SWG Cost Engineer
- Lisa Finn, SWG Environmental Project Manager
 - Andrew Smith, SWG Resident Engineer
 - Paulino Sandoval, SWG Project Engineer

Leveraging/Collaborative Opportunities

• Previously completed NEPA approval for the selected BU sites, including FWS coordination.

Stakeholders and Partners

- Port of Victoria
- Fish and Wildlife Service
- Local waterway users



Numerical Modeling



Bathymetry data:

- NOAA DEM (MLW)
- ADCIRC database (MSL)
- SWG channel data (MLLW)

Vertical datum:

- 8773037/SDRT2 (Seadrift)
- 8774230/AWRT2 (Aransas Wildlife Refuge)
- 8773701/PCNT2 (Port O'Connor)

MSL (MTL) = MLLW (~ MLW) + 0.055 m



Numerical Modeling Model Domain



CMS model domain

San Antonio Bay depth contours

FY18 RSM IPR SWG, CTV BU Utilization Prical Modeling Water Level a



Numerical Modeling Water Level and Waves





Model WL @ NOAA Seadrift Station

Numerical Modeling Modeled Morphology Change, Nov 2016 – Apr 2017



Existing Condition

Alt 1





Numerical Modeling Modeled Shoaling Rate



Comparison of model channel shoaling rate

Section	Station Range	Model Channel Shoaling (CY) Nov 2016 – Apr 2017		Annual Mean Shoaling Rate (CY)
		Existing Configuration	Alt 1	Existing Channel
1	0 – 200+00.00	124,900	93,500	123,600
2	200+00.00 – 400+00.00	161,100	123,600	171,300
3	400+00.00 – 650+00.00	159,400	135,000	178,300
1-3 (Total)	0 – 650+00.00	445,400	352,100*	473,200

* 21% reduction of channel shoaling rate



Challenges and Path Toward Implementation

PA 2:

- Initial coordination with FWS for -FY18
- Do not require additional funding
- Anticipate implementation in conjunction with next cycle – FY20
- Unconfined placement

PA 3, 12, & 15:

- Oyster habitat mitigation likely
- Additional funding may be required
- Potential construction in coordination with FY20 cycle





Benefit to USACE and the Nation

CTV RSM

- Dredging the Lower Reach of the GIWW, CTV
 - Dredged every 1-2 years
 - ~900k CY dredged per cycle
- Dredging Channel to Seadrift
 - o Dredged every 7 years
 - o ~450k CY per cycle
- Area to be created
 - PA 2 Maintain and expand current extent of 22 acres
 - o PA 3 Restore 70 acres
 - o PA 12 Create 25 Acres
 - o PA 15 Restore 40 Acres





• Reduce the cost of dredging

- Shorten pipeline length
- Reduce/eliminate maintenance costs associated with maintaining upland PA's
- Reduce quantity dredged for each cycle

A more resilient Navigation Project

- o Increase capacity for dredged material
- Multiple placement sites available for emergency dredging
- o Decrease shoaling from storm events





Habitat creation/restoration

- Eroded areas of land will be restored and maintained - critical habitat for whooping cranes (Grus americana)
- Living shorelines habitat within the intertidal zone and shallow water

