Galveston GIWW, Laguna Madre

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Location: Galveston GIWW, Laguna Madre

Type: Marsh nourishment/ Dredged material disposal

Area: 729 mi^2 (at high water)

City: Multiple cities in the South Texas Gulf Coast

County: Nueces, Kenedy, Kleberg, Willacy and Cameron

Agencies: USACE – Galveston District, TxDOT, USEPA, USFWS, National Marine Fisheries Service, TGLO, TCEQ, TPWD, and the Texas Water Development Board

State/Province: TX

Country: United States

Background

Laguna Madre, the longest barrier island in the world, is located in the south of Texas Gulf Coast. It is divided in two segments by a 12 mi long expanse of seldom-flooded sand and mudflat, and is approximately 3.3 ft deep. Upper Laguna Madre, located northward of the flat, is approximately 50 mi long and 2 – 4 mi wide. Lower Laguna Madre, located southward of the flat, is approximately 59 mi long and 2 – 7 mi wide. Ecologically, the lagoon is characterized as exhibiting hypersaline conditions, barren shorelines with extensive wind-tidal flats, extensive submerged seagrass meadows, and a highly productive finfishery (TCEQ 2014). The lagoon is also unusual for being one of only five hypersaline coastal ecosystems in the world (Javor, 1989). The Laguna Madre section of the Gulf Intracoastal Waterway requires regular maintenance dredging to maintain the waterway navigable. Several dredging and placement alternatives are being considered in the Dredged Material Management Plan (DMMP) for shoaled material in this area of the GIWW. The Placement Areas (PAs) will be managed primarily for reducing impacts to nearby seagrass habitat, but some sites will be managed for bird use, vegetation control, or public recreation use. Thin layer placement is being considered for some of these PAs (USACE and ICT 2002).

Project Description

The DMMP assumes that dredged material placement activities will use a dispersing or energy dissipating device to spread the material in a thin layer to decrease the chance of burying seagrass too deep to recover and prevent causing scour holes when the material exists the discharge pipe. Thin layer placement was recommended for PAs 203, 207, and 232. PA 203 is an upland site about 2 miles long with no bird use. Material consisting of an average of 27% sand will be placed hydraulically by moving the dredge pipe frequently to deposit only a thin layer. First the material will be placed in the unconfined portion of this PA until reaching the confined area and then the rest will be placed in the leveed section of the PA. PA 207 is a short PA that is fully confined. The

material will be placed in a thin layer in the unleveed section of the PA by moving the dredged pipe frequently during placement. PA 232 consists of a chain of small islands with some bird use and extensive seagrass beds. Shoaling is the main problem in areas adjacent to this PA. Placement of a 3 in. layer of dredged material was recommended for this PA to avoid adverse impacts to the seagrass, previous studies have shown that seagrass can recover if burial is no deeper than about 3 inches. The material consisting of an average of 17% sand will be spread along the PA with a diffuser at the end of the pipe. In order to help retain more material on the islandes, the south and west boundaries will be expanded to enclose all of the islands (USACE and ICT 2002).

Findings

These placement efforts showed that long term impacts to seagrass from being covered with a thin layer of dredge material would be minimized if the material was placed in the winter months when the seagrass is photosynthetically inactive (Galveston Bay Foundation 2012).

References

Galveston Bay Foundation (2012) USACE Makes Changes to West Bay Dredging Project. Webster, TX.

Javor, B., 1989, Hypersaline environments: New York, Springer-Verlag, 328 p.

Onuf, C.P. (N.D.) Laguna Madre. U.S. Geological Survey, National Wetlands Research Center

Texas Comission on Environmental Quality. Accessed on 8-20-15. Oso Bay and the Laguna Madre: Assessing the Aquatic Life Use. http://www.tceq.state.tx.us/waterquality/tmdl/24-osobayoxygen.html.

USACE and ICT (2002) Laguna Madre GIWW Dredged Material Management Plan.

Points of Contact

Information on thin layer placement (TLP) case studies has been compiled as part of a DOTS/EWN project to provide a source of information, knowledge, and experience on TLP of sediment or dredged material in aquatic environments. The Thin Layer Placement Website and Map-Portal are funded by the US Army Engineer Research and Development Center (ERDC). POCs for the Thin Layer Placement Website and Map-Portal are:

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