Bayou Segnette Waterway

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Location: Bayou Segnette Waterway

Type: Sediment remediation/thin layer capping

Area: 21,772 acres

City: New Orleans

County: Jefferson Parish

Agencies: US Army Corps of Engineers New Orleans District

State/Province: Louisiana

Country: United States

Taken from Suir et al. 2013

Background

Bayou Segnette Waterway (BSWW) is located within the Barataria watershed basin and the Jean Lafitte National Historical Park and Preserve (JLNHPP) approximately 6 miles southwest of New Orleans, LA. This area consists of comparatively healthy attached and floating fresh marshes (Suir et al 2013). Some marsh areas along BSWW consist of elevations lower than those ideal for fresh marshes. The waterway has a history of shallowness due to shoaling; therefore, maintenance dredging is required on a regular basis. Innovative placement methods are required since traditional placement sites along BSWW are either at or near capacity. Thin layer placement could be potentially applied to the marsh areas with lower elevation to provide additional thickness and nutrient benefits. One of the objectives of this project was to evaluate thin layer placement capacity in the floating marsh area as a function of spray distance.

Project Description

In 2010, thin layer placement of organic material was applied within the JLNHPP area. One growing season after material placement the site was visually inspected, no quantitative monitoring was conducted however. Thin layer capacity in the floating marsh was estimated for different spray distances (50 – 300 ft) from the top of the spoil bank assuming an initial compression factor of 4, 50 ft buffers to a distance of 300 ft, and different target thickness (0.79, 1.18, and 1.57 in.). The assumed compression factor leads to a final bulk density of 1 g/cm^3. The study assumed that the areas identified as floating in the 1996 flotant survey remain floating.

Findings

Visual inspection of the 2010 thin layer placement sites indicated that the areas appeared to be thriving one growing season after placement. The existing Typha spp. Vegetation was rotted and/or lodged, allowing for the robust re-growth of Sagittaria spp. (Suir et al. 2013). Results obtained from this study showed that thin layer capacity is dependent on the location of the discharge pipe and the placement thickness of the material. If the discharge pipe is located at the top of the spoil bank (as assumed) most of the material can be placed directly on the marsh. The sediment from BSWW has a higher mineral content, therefore, it is expected that thin layer placement would increase the floating marsh bulk density and decrease buoyancy. Based on previous studies that show that freshwater marshes are more sensitive to placement thickness than salt marshes (Ray 2007), a placement depth smaller than 1.57 cm after dewatering and initial compression was recommended. Thin layer placement capacity ranged from 12,000 (50 ft spray distance, 0.79 in. thickness) to 143,000 CY (300 ft spray distance, 1.57 in. thickness). Settling tests and modeling, and flow behavior modeling on the BSWW dredged material using a a software package such as the Automated Dredging and Disposal Alternatives Modeling System (ADDAMS) (Schroeder 1997) was recommended to obtained a more accurate estimate of thin layer placement capacity. Pilot scale studies were also recommended to determine the response of floating marsh to thin layer placement of dredged material. Ultimately, the success of thin layer placement on floating marsh depends on the ability of the marsh to maintain buoyancy during and after placement, and the resiliency of marsh vegetation.

References

Ray, G. L. 2007. Thin layer placement of dredged material on coastal wetlands: A review of the technical and scientific literature. ERDC/EL Technical Notes Collection ERDC TN-07-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Schroeder, P. 1997. Automated Dredging and Disposal Alternatives Modeling System (ADDAMS).

Suir, G.M.; Piercy, C.D.; Johnston, J.B. (2013) Bayou Segnette Waterway Dredged Material Placement Study Preliminary Assessment. ERDC/EL TR-13-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

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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