

THIN-LAYER PLACEMENT PROJECT SHEET



Barataria Basin, Louisiana

July 2017

Location: Barataria Basin, Louisiana

Type: Marsh restoration

Area: ~ 17 m²

City: n/a

Parish: Lafourche

Main Agencies: Louisiana State University, US Geological Survey

State/Province: Louisiana

Country: United States

Background

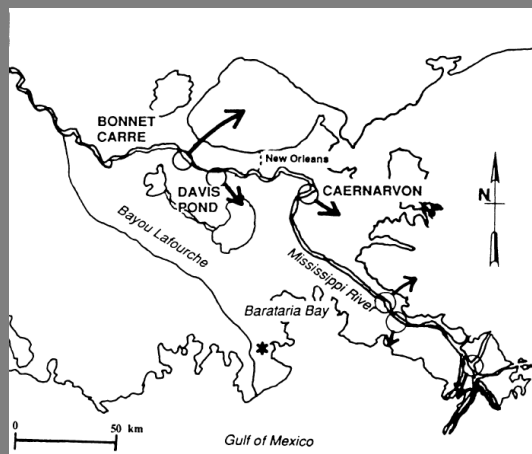
A thin layer of dredged material was placed in a marsh located south of New Orleans within Barataria Basin, near Bayou Lafourche, to improve vegetation stress from increased inundation and high sulfides. Marshes within Barataria Basin are rapidly subsiding due to leveeing of the Mississippi River and loss of regular sediment depositional events. An inadequate supply of sediment to these marshes resulted in failed vertical accretion and increased inundation leading to vegetation death.

Project Description

The salt marsh received sediment additions in July 1986 from a nearby location. Applied sediment consisted of 40% fine sand, 28% coarse-fine silt, and 32% clays and organics. The dredged sediment was manually placed on the marsh surface at depths of 0 cm (control), 2-3 cm, or 4-5 cm. Each of these sediment thicknesses was applied in four replicates. One year later, two of the four replicates of each sediment depth received a second addition of sediment 2-3 cm or 4-5 cm, with total sediment additions of 4-6 cm or 8-10 cm. Aboveground biomass production of *Spartina alterniflora* was assessed as well as the nutrient status of the clipped vegetation. Vertical accretion rates were determined using the radioisotope ¹³⁷Cs in a nearby stable streamside marsh and in the deteriorating marsh.

Findings

Accretion rates in the deteriorating marsh was 0.44 cm yr⁻¹ in comparison to 0.8 to 1.0 cm yr⁻¹ in the stable streamside marsh. The addition of sediment resulted in a significant increase in aboveground biomass and was higher in the marsh areas that received higher sediment applications. The vegetation contained significantly higher concentrations of Fe, Mn, and P in treated areas than reference areas. The addition



DeLaune et al., 1990.

of sediment to the marsh surface increased plant productivity due to an increase in elevation that reduced inundation and increased nutrient supply.

References

DeLaune, R.D., S.R. Pezeshki, J.H. Pardue, J.H. Whitcomb, and W.H. Patrick, Jr. 1990. Some influences of sediment addition to a deteriorating salt marsh in the Mississippi River Deltaic Plain: A pilot study. *Journal of Coastal Research* 6:181-188.

Point of Contact

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Main Agencies:

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US Geological Survey

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). The POC for the Thin Layer Placement Website and Map-Portal is:

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