High Salt Marsh in Georgia

August 2016

Location: High Salt Marsh in Georgia

Type: Historical dredged material placement, marsh restoration

Area: Approximately 150 m^2 (1,614 ft^2)

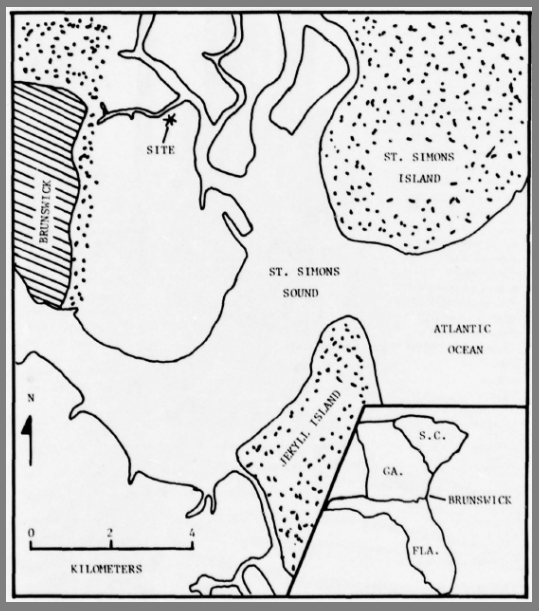
City: Brunswick

County: Glynn

Agencies: U.S. Army Engineer District, Savannah, GA; University of Georgia Marine Extension Service; U.S. Army Waterways Experiment Station.

State/Province: Georgia

Country: United States



Taken from Reimold et al. 1978

Background

This project was conducted back in the 1970s when new dredged material disposal alternatives were being researched. Placing dredged material in a thin layer on the surface of an existing coastal wetland in close proximity to dredging operations would provide a cost effective and environmentally sound alternative when there are no available disposal sites nearby. The purpose of this project was to evaluate the recovery response of salt marsh vegetation and impact of selected species upon thin layer placement of dredged material. Controlled thin layer placement of dredged material on coastal marshes is an alternative that can meet the aesthetic, ecological, and economic standards set by coastal citizens since the coastal area would be environmentally protected.

Project Description

A high, intertidal, homogenous *Spartina alterniflora* marsh located in Glynn County, Georgia was selected to conduct this pilot research project between 1976 and 1978. Corrugated metal pipes with a 0.9 m (~ 3 ft.) diameter of various length were inserted into the marsh substrate to a depth of 1.2 m (Reimold et al. 1978). Inserting the pipe to 1.2 m ensured that only the enclosed area (plants, organisms and substrate) would be influenced by dredged material placement. Six different dredged material thicknesses were tested including 8 cm (3 in.), 15 cm (6 in.), 23 cm (9 in.), 30 cm (12 in.), 61 cm (24 in.), and 91 cm (36 in.) to capture the impact of layer thickness. Also, three different types of dredged material predominantly encountered in the Southeast of the U.S. were selected for this study to evaluate the impact of dredged material physical nature. A coarse sand from Buttermilk Sound, GA; a sand and clay mixture form the Darien River, GA; and a clay from Jekyll Creek, GA were tested in this study. In addition to this also three different times for material deposition were selected, February, July and November, to capture the impact at different stages of plant growth and seasonal effects. Each test was conducted in triplicate, except for the tests

conducted in November which were conducted in duplicates. Experimental control areas, and adjacent marsh controls were also setup at the site. The experimental setups, experimental control areas, and adjacent marsh controls were monitored monthly for two years for culm, live crab, crab burrow, and marsh snails' density determinations. The soil chemistry, and tidal data for experimental area were also determined.

Findings

The results from this pilot scale study indicated that marsh elevation could be altered through thin layer placement of dredged material without loss of the functional values of the ecosystem and environment. The results of this study indicated that dredged material placed on the marsh surface in a layer no thicker than 23 cm (9 in.) does not significantly impact the growth of marsh plants. *Spartina alterniflora* was able to penetrate up to 23 cm of each type of dredged material and exhibited biological growth and production nearly equal to that in undisturbed marsh (Reimold et al. 1978). Accurate tidal and elevation data should be collected before dredged material placement since the final marsh elevation must be within the elevational range of the marsh and should not exceed the elevation limit of the existing marsh. The clay dredged material had an initial increased growth in plant population as compared to the other tested material since it provided additional nutrients. After monitoring completion, the three types of dredged material used in the study had similar performance. Seasonal effects did not have a significant impact on the obtained results. Crabs were able to recolonize areas with clay material thicknesses up to 23 cm (9 in.) and sand up to 15 cm (6 in.). Snail populations were destroyed upon placement, however; the populations rapidly recolonized at depths up to 15 cm (6 in.). The return of snails depends on the recovery of *Spartina alterniflora*. Also, faunal recovery may depend on the proximity of the disposal area to natural populations and the extent of the smothered areas (Reimold et al. 1978)

References

Reimold, R.J.; Hardisky, M.A.l Adans, P.C. (1978). The Effects of Smothering a Spartina Alterniflora Salt Marsh with Dredged Material. U.S. Army Engineer Waterways Experiment Station, Environmental Laboratory, Vicksburg, MS, US. TR-D-78-38.

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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