Dredge Sediment Placement For Phytoremediation and Upland Placement Site Restoration

Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS BUILDING STRONG®

Focus Area

Navigation

Problem

The United States Army Corps of Engineers' mission to evaluate and move dredge sediment requires innovative solutions to meet the demand for the 70% beneficial use of dredge sediment by 2030. This beneficial use of dredge sediments includes the use of confined disposal facilities (CDF) to help restore capacity. However, CDF sediments are often viewed negatively by communities and perceived as contaminated, making beneficial use challenging.

Study Description

This study will focus on beneficially using dredge sediment from CDFs to 3D print deployable structures embedded with upland seeds. The study will have 3 primary objectives: 1) determine the best structure and 3D printing methods for successful seed germination, 2) determine phytoremediation capabilities of upland seeds for potential contaminants of concern in dredge sediment in greenhouse laboratories., and 3) field-test CDF-printed dredge material embedded with upland seeds to assess successful phytoremediation and seed germination.

Products

ERDC Technical Note (Q4 FY25) – Method development for upland seed germination in 3D printed dredge sediment

Journal Article (Q4 FY26) – Phytoremediation of dredge sediment contaminants of concern by upland plants

Guidance document (Q4 FY27) – Methods and field placement of dredge sediment pods

Presentation (Q4 FY27) – Presentation to coastal working group on the developed methods and research

Summary

A detailed method and understanding of the potential for upland plant phytoremediation and upland replacement using dredge sediment will guide future beneficial use of dredge sediment to meet USACE beneficial use goals. This research topic will explore, develop optimal methods, and guide the use of dredge sediments for the 3D printing designs for upland field placement for phytoremediation of contaminants. The research topic will increase USACE understanding of potential new ways of beneficially using dredge sediment for contaminant remediation and site restoration.

Balancing operational and environmental initiatives and meeting complex challenges of dredging and dredged material placement in support of the navigation mission.

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Research Products

Product Type	Product Title

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