



Dredged Sediment Amendments to Improve Floodplain Cropland Productivity

ERDC Dredging Operations Technical Support Program (DOTS)

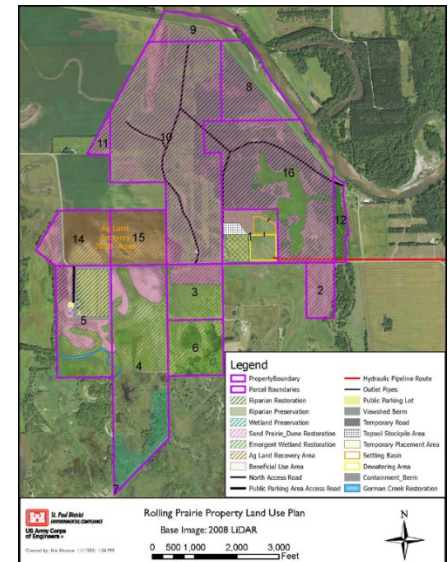
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Response Summary:

USACE St. Paul District faces significant dredged material management problems in the confined channels and floodplain where they dredge about 1 million cubic yards of clean sand annually. Traditional dredged material management uses temporary floodplain stockpiles that are off-loaded to upland use or storage in old quarries. Large amounts of sand have been diverted to habitat restoration projects, and there is a desire to find other beneficial uses. The recent acquisition of a 950-acre parcel, Rolling Prairie, provides a 100-year plan for Pool 5 dredged material. The site is adjacent to an existing off-load and stockpile facility, and it has a mix of prairie and wetland enhancement and material storage opportunities. The large site will be contract farmed concurrent with other activities.

The large land acquisition and ongoing contract farming present an opportunity to evaluate sand amendments to improve soil structure in marginal croplands by adding sand to clay dominated soils to improve drainage and by extension productivity. A multiple plot study will be implemented to evaluate the effects of using different methods of to incorporate sand into existing soils. Proposed methods include thin-layer placement, comingling, base-layer (terrace) placement, and base-layer placement with comingling. DOTS support is maintaining an ERDC-EL PDT member to assist the project and support collaborative research. A DOER proposal has been submitted to fund agronomic research starting in FY22.



Period of Performance:

December 14, 2020 – September 30, 2021

Benefits of the Response to the USACE Dredging/Navigation Program:

The USACE Dredging/Navigation Program is benefited by the development of technical methods to use dredged material to improve cropland. The successful demonstration could support “distributed” dredged material management where future fee title land acquisition cost would be minimized or eliminated by using easements or non-standard estate agreements to place sand on crop fields in the proximity to dredging activity. Cropland dredged material placement can reduce navigation operation costs and improve crop productivity. The site management and research activities will help establish policy, land management, and monitoring/evaluation guidance for technology transfer to other sites.

Deliverable:

The DOTS response put an ERDC researcher on the Rolling Prairie PDT where the team collectively developed a multiple-purpose land use plan including dredged material volumes, research locations, and site logistics. Site activities are scheduled to scrape and store topsoil, terrace low floodplain, and replace topsoil starting in spring 2022 when sand amendment plots will be established concurrently. Eric Hanson, MVP, will work on a PhD in agronomic science at the University of Minnesota where Dr. Theiling will serve on his committee. A DOER proposal was developed and submitted.



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers Operations and Maintenance navigation and dredging missions

Zachary Tyler & Dr. Jarrell Smith
Coastal and Hydraulics Laboratory • Zachary.J.Tyler@usace.army.mil;
Jarrell.Smith@erdc.dren.mil

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