



# Innovative Rapid Riverine Shoal Removal Technology RT24-17

## Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS

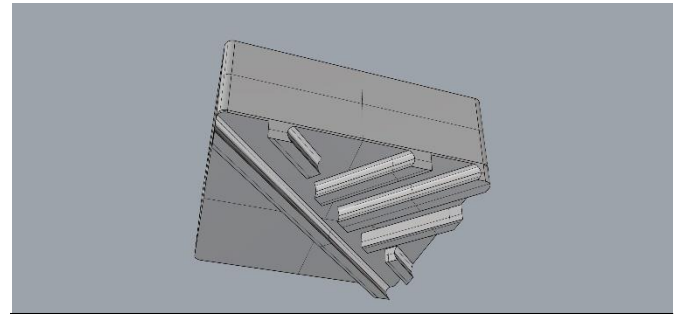
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### Focus Area

Innovation in Sediment Management - Innovative Construction and Operations Technologies

### Problem

Riverine shoaling is a major issue that can cause disruptions to Inland Navigation, resulting in negative economic impacts including time spent waiting for the shoal to be cleared for safe passage, increased fuel consumption, and delays in barge deliveries. A need exists to evaluate the effectiveness of an Innovative Rapid Riverine Shoal Removal Technology (RT24-17) to limit the excess costs and environmental impacts caused from traditional dredging operations.



Preliminary design of Barge Blades

### Study Description

This concept was originally developed with assistance from a towboat captain who had offered ideas to create a bed leveler barge. An experimental physical model will be constructed utilizing USACE Engineering Manuals on Dredging Operations and any Public, Private, Academic, and international research on the topic of shoal removal and innovative dredging methods. The technical review will be specifically focused on Water Injection Dredging, Agitation Dredging, and Bed Leveling. Knowledge from previous WID studies will be incorporated into the design of the pump and intake system, manifold, and jetting nozzles. The experiment will include both 1:50 and 1:10 scale models performed in flumes with sand waves and varying flows to test the effectiveness of the barges dredging capabilities. The barge will have blades similar to a road grader with internal water jetting nozzles to disturb the bed material while it rides along the shoaling areas. The barge will also have 4 internal ballasts to control the depth and pitch needed to dredge the shoaling areas. Load cells will be used to measure the force required to move sediments with the barge. By performing small scale models inside of flumes, concepts can be tested and improved to demonstrate potential for a future full-scale deployment.

### Products

Peer- reviewed reports discussing methods and results of the research will be produced as a result of this RT. Technical reports and journal papers generated by this RT will provide information on the development of this new dredging technology and potential deployment strategies for rapid use riverine dredging. All materials produced from this RT could offer further assistance in adaptative dredging practices.

### Summary

The USACE is seeking ways to efficiently maintain riverine channels. This project is developing a system to dredge shoaling areas by combining barge technologies and water injection dredging practices. This system could significantly reduce costs associated with dredging operations as well as reduce the total carbon footprint required to maintain navigation channels.



*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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October 2023

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