



# Automated Bin Measure Method for Fine-Grained Loads as a Contract Payment Basis

## Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS

BUILDING STRONG®

### Focus Area

Dredged Material Management

### Problem

The preferred payment method for hopper dredging is by volume (cubic yard) determined from pre-dredge and post-dredge hydrosurveys. However, sometimes, the work area is too dynamic or sea conditions too rough to obtain accurate hydrosurveys. Other times, the work area is too small to measure accurately by hydrosurvey and/or the duration of the dredging is too short to get hydrosurveys without causing costly delays to the dredging operation or in other areas multiple dredges are operating in the same reaches. Payment for dredging in areas that cannot be feasibly measured by hydrosurveys can be made on a rental (hourly/daily) basis but there is no production incentive for rental contracts; this can be costly to the Government and is not the preferred payment method. If dredged material could be accurately measured in the hoppers, payment could be made on a per yard basis, thus maintaining a production incentive and keeping costs down. A mechanical ullage sensor bin measurement system has been developed for hopper dredges by the DOER and DIG programs for use on west coast dredging projects but this system has been designed for measuring sand loads. MVN, the district that uses more rental contracts than any other district, has expressed interest in modifying this mechanical ullage sensor system for use on dredging projects with loads that are comprised of finer-grained sediments.



### Study Description

The objectives of this research task are to evaluate modification of the hopper dredge mechanical ullage system for use as a volume payment basis for use in fine-grained loads as well as sand loads. If determined practical (e.g., accurate, precise, and robust enough) then implement this bin measurement system as a payment basis in lieu of rental contracts. If not used for payment, this system could be used to more accurately measure volumes of dredged material going into the placement area to facilitate more efficient dredging project management.

### Products

The products specifically listed below would consist of contract technical specifications that districts could use to implement this measurement system in their contracts. The existing mechanical ullage sensor system would be modified to measure hopper loads in both sand and fine-grained sediments. Two technical reports and peer reviewed journal article will be produced to inform and provide guidance on this system's use.

### Summary

This research task is investigating the feasibility of modifying an automated mechanical ullage sensor system (originally designed to measure sand loads) for use in fine-grained material. An automated accurate hopper dredge bin measurement system that can be used as a payment basis in both fine and coarse-grained sediment loads that could be used in lieu of rental contracts will incentivize dredging contractors to maximize production and improve quantification of dredged material being placed to improve dredging contract management efficiency.



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



Tim Welp

Coastal and Hydraulics ERDC Laboratory • Timothy.L.Welp@usace.army.mil

November 2018