Evaluating Unmanned Surface Vessel (USV) to Improve Habitat Monitoring Near Dredging Operations

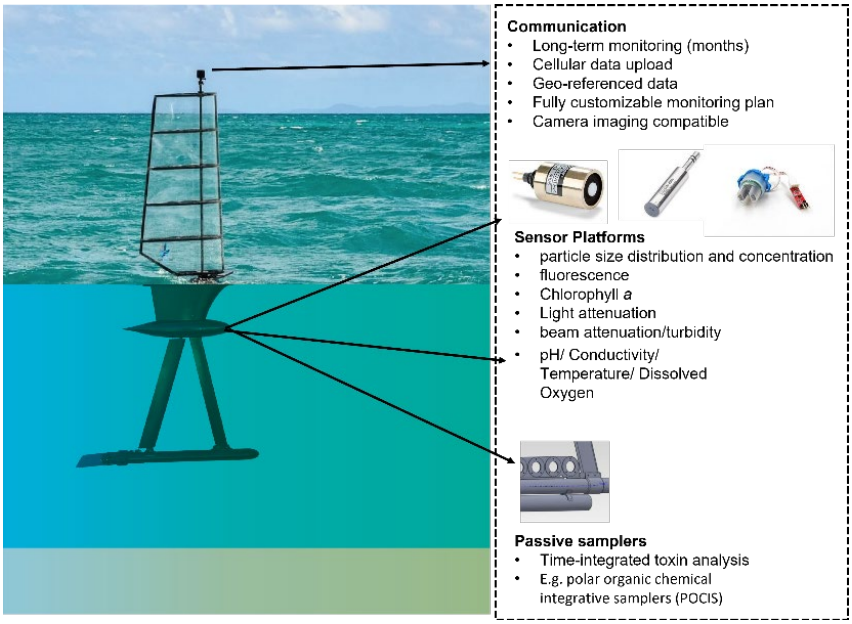
Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS BUILDING STRONG®

Focus Area

Risk Management

Problem



Monitoring spatial and temporal extents of dredge-exposure parameters (e.g., turbidity, total suspended solids, light attenuation, soundscape) are critical to understanding exposures and risks near dredging operations; however, traditional water quality monitoring methods near sensitive shallow water habitats often pose inherent logistical and cost challenges. Unmanned surface vehicles (USVs) are an emerging technological advancement that are currently being adopted by many USACE districts to improve monitoring efficiencies of the navigation program and can potentially augment or replace traditional monitoring approaches and drastically improve exposure predictions for critical aquatic resources. Many of these technologies could improve real-time data monitoring of sensitive habitats, avoid impacts, and thus improve coordination and collaboration with resource agencies and stakeholders.

Study Description

The objective of this research task is to demonstrate USV efficacy for surveying and estimating dredge plume parameters (e.g., turbidity, total suspended solids, light attenuation, soundscape) and determine how these real-time or near-real time data can be incorporated with other observation tools (e.g., satellite imagery, buoy sondes, manned vessels) to understand the spatial and temporal extents of dredge-induced turbidity events and soundscape. The overall approach will entail 1) identify remote sensing technologies relevant to biological receptors of interest and exposures of dredging operations, and 2) conduct two or more field demonstrations leveraging an existing capability in EL using an autonomous semi-submersible sailing vessel or other relevant platforms.

Products

FY23: Tech Note (TN): “Taking the ‘biological’ perspective to inform underwater remote sensing technology needs”; and Tech Note (TN): “Field demonstration results of applying USV water quality monitoring capabilities near dredging operations”

Summary

This research will be beneficial to collecting specific and applicable real-time or near real-time water quality and soundscape data near dredging operations. If successful, these technologies can reduce the use of assumptions in analysis, improving and expediting the consultation process. The net benefit of the research would be a reduction in labor costs to the agencies and the public. The potential impacts to the Corps navigation mission extends to all Corps Districts with projects or studies involving dredging operations.

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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