



# Next Gen Dredging/Water Quality Evaluation, Monitoring and Sensing for Risk Management

## Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS

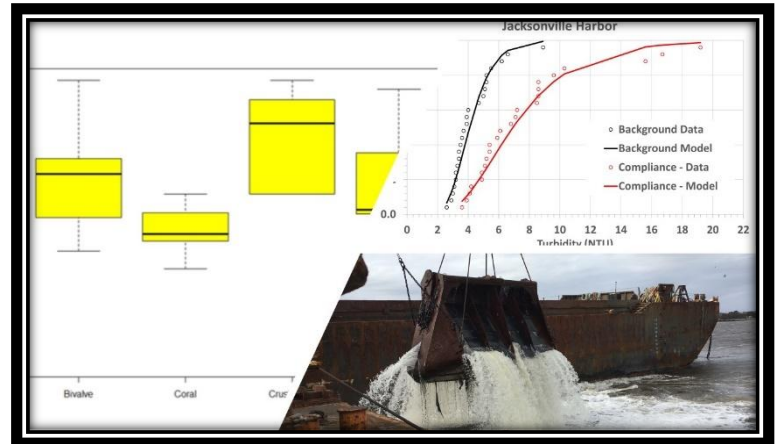
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### Focus Area

Risk Management

### Problem

USACE makes large investments to both evaluate sediments prior to dredging and to monitor water quality during dredging. These efforts need to be linked with information technology for near-real time data visualization to ensure these dual investments are directly feeding a management decision and not wasted. Correlations between overly conservative elutriate limiting permissible concentrations and actual plumes during dredging and disposal are needed. This can reduce costly impacts on dredging such as bin restrictions or ceasing of operations. Advancements are needed in data collection strategy, measuring and monitoring technology and automated analysis and interpretation.



### Study Description

The purpose is to modernize, innovate and automate routine field assessments of DM operations and plumes to determine water/sediment quality for management decisions, which have historically involved manual (imprudent) field-collection of massive amounts of material and/or data. This effort will catalogue existing field ready measurement technologies and innovate novel sensing technologies in a DM monitoring context. It will relate current and future thinking to determine if this capability could reduce future routine 103/404 evaluation testing. Execution will be accomplished by 6 interrelated tasks: (1) integration of available plume data into rapid visualization database; (2) development of novel monitoring capabilities; (3) success stories documentation; (4) tool building to “read-in” current and future collected data with risk threshold interpretation; (5) demo using USACE relevant harbors; and (6) USACE transition.

### Products

**FY23:** USACE Water/Sediment Quality: Current Practice to State of the Science (Tech Note, Video); Functional database & Electronic Data Deliverables (EDDs) template; **FY24:** Novel risk-based DM data analysis tool; **FY25:** Prototype field monitoring devices; Journal Article: comparison between laboratory simulation and field realism for management.

### Summary

The result of this effort is a compelling, data-based argument that more robust monitoring automation with operational adjustments can supersede imprudent, repeated full re-evaluations at taxpayer’s expense. This effort defines a strategic roadmap to improve value of current and future sediment and water quality monitoring and management decisions directly of value to the USACE dredging and sustainability missions. This effort projects significant modernization in the data interpretation, analysis and collection approaches through faster and cheaper monitoring and sensors. USACE would realize cost savings by reducing: (1) imprudent evaluations; (2) dredging monitoring in low-risk areas; and (3) collection of irrelevant data not used for management decisions. The result will be increased understanding of current motivation for, and purpose of USACE water/sediment quality monitoring and a path to improve the relevancy and quality of the data collected to facilitate near-real time visualization and better-informed risk management decisions during dredging.



*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  |
|------------------------|--|
| WEDA Proceedings Paper | Improving Turbidity Monitoring Using an Autonomous Underwater Vehicle Near Dredging in Coastal Louisiana<br><a href="https://www.westerndredging.org/images/2024/Papers24/5D-2.pdf">https://www.westerndredging.org/images/2024/Papers24/5D-2.pdf</a>  |
| ERDC Technical Report  | Next-Generation Water Quality Monitoring during Dredging Operations<br><a href="http://dx.doi.org/10.21079/11681/49194">http://dx.doi.org/10.21079/11681/49194</a>   |
| ERDC Technical Memo    | ERDC scientists assist USACE New Orleans District with turbidity assessment at Bayou Rigaud<br><a href="https://www.erd.usace.army.mil/Media/News-Stories/Article/3434801/erd-scientists-assist-usace-new-orleans-district-with-turbidity-assessment-at/">https://www.erd.usace.army.mil/Media/News-Stories/Article/3434801/erd-scientists-assist-usace-new-orleans-district-with-turbidity-assessment-at/</a> |



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