

Journal Article Presents Results from a Review of Microplastics in Sediments Across the Contiguous US and Provides a Supporting Online Database

Impact Statement: ERDC Environmental Laboratory (EL) researchers published a research paper presenting results from comprehensive review of >100 publications reporting microplastic concentrations in sediments across freshwater and marine ecosystems. Results were provided in an online searchable database to support risk communication.

Regulatory agencies, public health officials, scientists, and the public are increasingly concerned with microplastics in the environment due to their potential implications on human health, regulatory frameworks, and environmental ecosystems.

The USACE confronts these concerns directly, annually dredging several hundred million cubic yards of sediment, often without data on microplastic abundance in shoaled channel beds requiring dredging.

The USACE Dredging Operations and Environmental Research (DOER) Program recognizes the potential concerns and challenges of plastics in dredged sediments; therefore, USACE funded an effort to synthesize existing peer-reviewed research to provide an understanding of microplastics in sediments destined for dredging (DOER 23-08, Guidance for Communicating Risks of Microplastics and Nanoplastics in Dredged Sediments <https://doer.el.erdcdren.mil/factSheets-archive.html>).

ERDC researchers Mr. Justin Wilkens, Dr. Alyssa Eck, Ms. Jonna Boyda, Dr. Alan Kennedy, and Dr. Andrew McQueen of the ERDC Environmental Laboratory (EL) developed a paper titled “Microplastic in Dredged Sediments: From Databases to Strategic Responses”. Through this literature review, the team gathered data on microplastic concentrations, morphologies, size ranges, colors, and polymer types, with the aim of equipping project managers with the knowledge needed to develop risk-informed strategies that balance environmental and operational demands in managing dredged sediments.

This information was collated into a microplastic database for sediments (MP-SED) (Figure 1) which is available at the DOER website (<https://doer.el.erdcdren.mil/microplasticdatabase.html>).

The work was published in the *Bulletin of Environmental Contamination and Toxicology*. Wilkens, J. L., A. J. Calomeni-Eck, J. Boyda, A. Kennedy, and A. D. McQueen. 2024. Microplastic in Dredged Sediments: From Databases to Strategic Responses. *Bulletin of Environmental Contamination and Toxicology*. 112(5), 1-8. <https://doi.org/10.1007/s00128-024-03878-x>

The work was presented at the Western Dredging Association Dredging Summit, Las Vegas, NV, 17-20 July 2023, and at the Society of Environmental Toxicology and Chemistry North America 44th Annual Meeting, Louisville, KY, 12-16 November 2023.

This research was funded by the USACE Dredging Operations and Environmental Research (DOER) Program.

POC: Mr. Justin Wilkens Justin.L.Wilkens@usace.army.mil

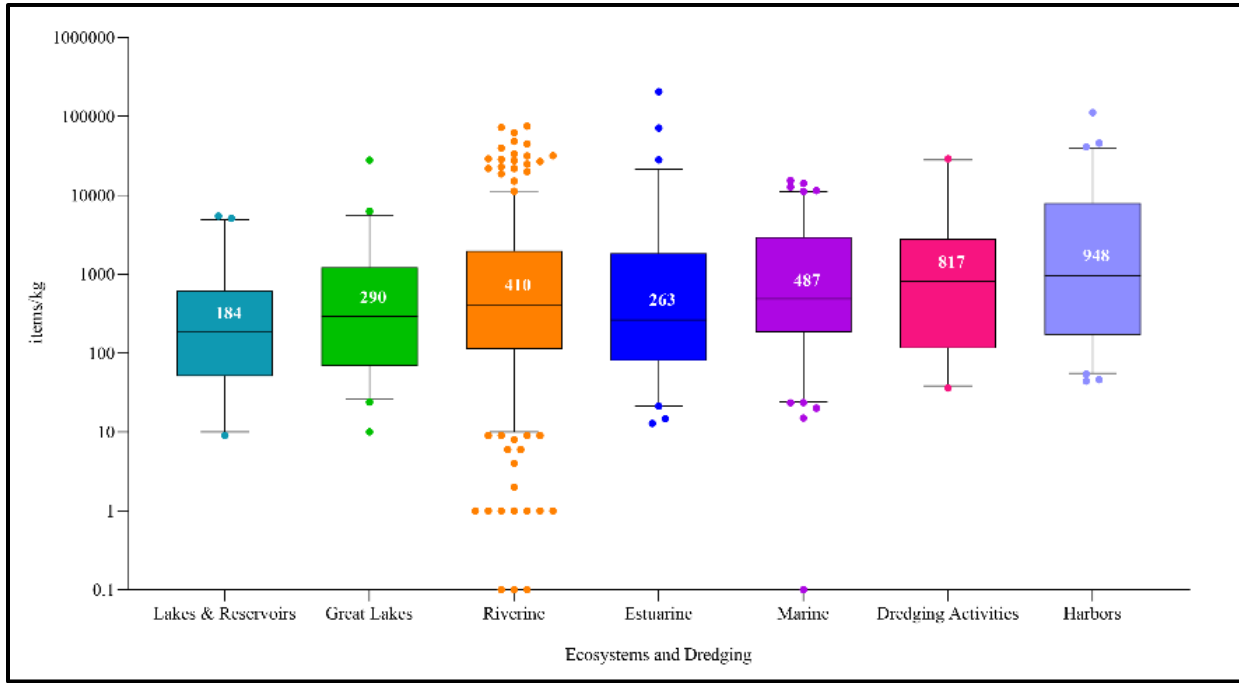


Figure 1. Distribution of microplastic concentrations (items/kg) reported in sediment samples. The box range = 25th to the 75th percentiles; median = horizontal line; whiskers denote the range from the 5th to the 95th percentiles. Dots indicate concentrations greater than 95th percentiles. (source: MP-SED 2023)