Development of Regional Background Levels for Sediment Associated PFAS in the Great Lakes

Dredging Operations Environmental Research (DOER) Program

U.S. ARMY CORPS OF ENGINEERS BUILDING STRONG®

Problem

Per- and polyfluorinated alkylated substances (PFAS) are a ubiquitous class of emerging contaminants of concern known to cause human health effects, with exceedingly low environmental screening or regulatory levels (e.g., parts per trillion in drinking water). While to date much of the attention by regulators and research focus has been on impacts to drinking water and ground water, PFAS is known to be globally distributed across all environmental media including sediment. A preliminary survey of sediments collected from locations throughout the US found measurable quantities of PFAS in every sample evaluated. Given the ubiquity of PFAS, a key critical first step will be the development of a basis for contextual understanding of sediment associated concentrations of PFAS.

Study Description

The objective of this project is the derivation of regional background concentrations of PFAS in Great Lakes sediments. In other words, the objective is to identify which PFAS are present and measure the PFAS sediment concentrations in the vicinity of Great Lakes harbors, from locations that are not associated with known sources of contamination. We propose to use an approach consistent standard guidance to derive regional background concentrations for sediment associated PFAS using data from recent sediment surveys (e.g., those conducted by USGS, NOAA, and other agencies and academic institutions) along with data from sediment samples to be collected for this project in the proximity to USACE managed federal navigation channels throughout the Great Lakes. Sediment PFAS concentrations will also be used to develop or model regional background values for sediment elutriates.

Products

This project will generate regional background concentrations of sediment associated PFAS in aquatic sediments representative of Great Lakes harbors. Results will be communicated with USACE district personnel, as well as summarized in one or more peer reviewed journal publications. The approach and technical basis for deriving background values will be described and discussed. In addition, a consensus guidance document (reflecting input from relevant stakeholders) summarizing how the values may be used to support sound risk management decision making will be developed.

Summary

Per and polyfluorinated alkylated substances (PFAS) are a ubiquitous class of emerging contaminants of concern known to cause human health effects with exceedingly low environmental screening or regulatory levels. Given the ubiquity of PFAS, near certainty of their presence in sediments and increasingly stringent regulatory levels, a key critical first step will be the development of a basis for contextual understanding of sediment associated concentrations of PFAS. We propose to derive regional background concentrations for sediment associated PFAS using data from recent sediment surveys along with data from sediment samples to be collected for this project in proximity to USACE managed federal navigation channels throughout the Great Lakes. Sediment PFAS concentrations will also be used to develop or model regional background values for sediment elutriates.

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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February 2025