Goldschmidt 2023 Abstract
https://doi.org/10.7185/gold2023.19608

Resuspension of mercury and polycyclic aromatic hydrocarbons from sediments

ALYSSA AZAROFF, BETTY CHAUMET, ANNA SOBEK, ELENA GOROKHOVA AND SOFI JONSSON

Stockholm University

Presenting Author: alyssa.azaroff@aces.su.se

Sediments play a crucial role in the functioning of aquatic ecosystems as they act as a repository for various substances, including pollutants. Therefore, sediment resuspension can cause the release of contaminants into the water column leading to increased uptake by aquatic organisms, and posing risks to the environment and human health. We study the release of methylmercury (MeHg) and polycyclic aromatic hydrocarbons (PAHs) from contaminated sediments as a function of sediment particle size distribution (PSD) and resuspension, assessed as water turbidity. We performed experiments using custom-made resuspension cores with artificial sediments at different PSD manipulated by clay addition (10 to 80%) and artificial brackish water. Resuspension was induced with the help of a magnetic stirrer placed 12 cm above the sediment surface. Each test sediment was spiked with a mixture of four PAHs and MeHg at 3 mg kg^{-1} and 5 µg kg^{-1}, respectively, and passive samplers were used to measure bioavailable concentrations in the water column. For all test sediments, resuspension induced the release of dissolved total Hg and PAHs and their concentrations were PSD-dependant, demonstrating that sediment structure and physical process associated with resuspension affect contaminant availability for aquatic organisms. In contrast, we did not observe dissolved MeHg release, suggesting that resuspension might favor abiotic demethylation. We will present the study outcome and discuss the possibilities of using passive samplers for assessments of the bioavailable fraction of these pollutants under various environmentally relevant resuspension scenarios.