TEMPORAL TRENDS OF TRICLOSAN IN DATED SEDIMENT CORES FROM FOUR URBANIZED ESTUARIES: EVIDENCE OF PRESERVATION AND ACCUMULATION

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Triclosan is an antimicrobial agent present in a wide array of consumer based goods such as soaps, skin creams and dental care products. It has also been incorporated into textiles and plastics due to its effectiveness as a biocide in solid material. It is introduced into municipal sewer systems where it is partially removed during wastewater treatment with the balance entering receiving waters via effluent discharge. The fate and effects of triclosan are poorly understood, particularly in estuarine environments. In this study, triclosan was measured in dated sediment cores from Boston Harbor, Narragansett Bay, New York Harbor and Chesapeake Bay in order to reconstruct the spatial and temporal trends of accumulation. Triclosan first appeared in each of the sediment cores near 1964, which corresponds with the U.S. patent issuance date of triclosan. The presence of triclosan at each of the study sites at or near the patent date indicates that long-term preservation is occurring in estuarine sediments. As concentrations of triclosan increase above background, temporal trends at each location are unique, reflecting between site variability. In Narragansett Bay, concentrations climbed to as high as 400 ng g^{-1}, due in part to local, commercial production of triclosan. Overall, results indicate that temporal trends of triclosan in the sediments of these estuaries do not reflect the reported increasing domestic usage of this compound over time.

Keywords: Triclosan; Emerging contaminant; Biocide; Sediment; Antimicrobial agent

PURPOSE STATEMENT

Triclosan is an antibacterial compound used in the formulation of a wide range of consumer and personal care products. Triclosan has been identified as a contaminant of emerging concern, with little known about its fate and effects, particularly in estuarine environments. This presentation presents the temporal and spatial distribution of Triclosan in sediment cores collected from four urbanized estuaries located on the Atlantic Coast of the United States. Triclosan appears in each of the cores at approximately 1964, which corresponds with its U.S. patent issuance date. The presence of Triclosan at each of the study sites close to the patent date indicates that long-term preservation is occurring in estuarine sediments. Results indicate that long-term temporal trends of Triclosan in these estuaries do not reflect the reported increasing domestic usage of this compound over time.