

Spatial Distribution of Triclosan in Sediments and Water of an Urbanized Estuarine Embayment

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Triclosan (TCS) is a broad spectrum anti-microbial compound found in many consumer and personal care products. TCS enters water bodies primarily through wastewater treatment plant (WWTP) effluent and may also be introduced by combined sewer overflows or surface water runoff. TCS undergoes photodegradation in estuarine waters and has a half life of approximately 10 days in surface waters. However, TCS also has a high K_{ow} and adsorbs onto particles where it is protected from photodegradation and can be preserved for long periods of time after deposition to sediments. The fate and transport of TCS in marine ecosystems are the subjects of this research. Sample locations were chosen from a statistically randomized hexagonal grid design of Greenwich Bay, which is located in Narragansett Bay, Rhode Island. Sediments were obtained from Van-Veen grab and water samples collected were passed through 1 μ m glass fiber filter media. After extraction, samples were derivatized and analyzed by GC/MS-ESI. Preliminary results show a high sediment concentration of TCS in Greenwich Cove which receives effluent from the local WWTP, designating it as major source of TCS to the area. Dissolved water concentrations are spatially variable, suggesting there may be other discrete sources of TCS to Greenwich Bay. Finally, a sediment core collected from the center of the bay shows a sustained decline from 1990 to the present, indicating an overall decrease in TCS release to the bay over time.

Keywords: Triclosan; Greenwich Bay; Wastewater treatment plant; emerging contaminants