

## ABSTRACT

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Title: Spatial and Temporal Patterns In Norwalk Harbor Sediment Contamination

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Year: 2021

The Norwalk harbor is an active and economically important harbor located along the Connecticut shoreline in western Long Island Sound. The harbor has many possible sources of contamination such as municipal wastewater treatment plants, coal/oil combustion, battery manufacturing, and historical contamination from the hatting and pottery industries. Previous studies have shown that the harbor sediment is contaminated with metals of environmental concern. Present day, a large portion of Norwalk's economic growth has come from its active shellfishing industry and it is essential to protect the shellfish from the contaminants within the harbor sediments. The objective of this study was to determine the spatial and temporal trends in sediment metal contamination. Sediment samples were collected on three separate occasions in 2018-2019 to determine the sediment physical and chemical properties. Results show that there is a well-defined spatial trend, with sediment metal contamination decreasing from north to south in the harbor. Sediment copper, zinc, and mercury concentrations ranged from 169 to 29.5 mg/kg, 396 to 95 mg/kg, and 1.23 to 0.13 mg/kg, respectively. The spatial trends in sediment metal contents correlated with the sediment physical properties (loss on ignition and grain-size). Results of this study were then compared to contaminated metals measured in previous Norwalk harbor studies over the past four decades (1976-2019). Linear regression analysis results showed decreasing trends over time, primarily in sediment copper and zinc within the river and inner harbor sections of Norwalk harbor.