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Thames River Watershed in Connecticut shows declining but still elevated trace metal pollution

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A watershed is like a bath tub, anything that occurs within its natural topographic jurisdiction is bound by gravity to flow to the exit. For the Thames River watershed in Connecticut, that exit is Long Island Sound. As a fisher and clammer of the southern Connecticut beaches, I felt strongly compelled to understand how safe the waters are.

The transport of trace elements like arsenic (As), lead (Pb), and others are governed both by the

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dissolved portions in the water (aqueous phase), and the solid portions carried in water (particulate/suspended sediment phase).

Lead by UMass '21 undergraduate Mark Butler, we collected soils, bottom sediments, suspended sediments, and river water samples to characterize if 7 watersheds had elevated trace element concentrations and if they were moving through the Thames River watershed and potentially to to Long Island Sound.

Our results show that soils and bottom sediments have elevated metal concentrations and suspended sediments and river water had elevated As throughout the watershed. Other metals like Pb were only elevated in 'hot spots'. Both dissolved water and suspended sediments were important for moving metals through the watershed.

Using a sediment core in the Thames River, we can see that export rates are decreasing through time but the long lag period following the pulse of pollution has a long tail into the 21st century.

Butler et al 2023 'Accumulation and transport of nutrient and pollutant elements in riparian soils, sediments, and river waters across the Thames River'

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