

Heavy Metal Contaminated Sediments of Lower Passaic River, New Jersey USA

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The lower Passaic River has been heavily impacted by industrial and urban expansion for over a century. Most of the natural physiography of the river has been modified, resulting in habitat destruction, wetland drainage, land alteration, garbage and sewage disposal, and releases of hazardous substances into the environment. Sources of contaminants to the river include permitted discharges, surface water runoff, atmospheric deposition, and combined sewer outfalls (CSOs). A historical review of water quality and sediment quality data reveals significant presence of wide ranges of toxic chemicals throughout the river, whose concentrations greatly exceed the sediment quality benchmarks and probable ecological stressors. Heavy metals remains chemicals of concern in the Passaic River and the extent and spatial distribution of these chemical within the river has remain a subject of study for better understanding and characterization of the contaminants and restoration purposes. In this study, portions of 10 years (1991-2000) data was analyzed using an integrated approach weaving geostatistics and Geographic Information Systems (GIS) to study the spatial distributions of metals (Ag, Cr,Hg, Pb, and Zn), and evaluate the transport of the metals with time using the contaminant inventory. The result from this study will provide pertinent information to coastal management issues in Passaic River.