

New Jersey Wastewater Infrastructure, Industrial Development, and New York Harbor Geochemistry: Early and Mid 20th Century

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The growth of industry and population in metropolitan New York and New Jersey in the early 20th century is a case study in rapid urban growth and its effects on both the social and natural environment. This project seeks to understand the environmental and industrial effects of specific policies, cooperative agreements, and infrastructural projects in the areas surrounding New York Harbor in the early to mid 20th century. The story of the Passaic Valley Trunk Sewer (PVST) installation in 1924 is an ideal case study, a combined industrial and human sewer draining 130,000,000 gallons/day of wastewater from Paterson, Newark and several other industrializing cities and towns in northern NJ directly into the New Jersey side of New York harbor. We seek to analyze fluxes in effluent into the harbor using sediment cores, one from the Hudson River below the George Washington Bridge (CD-02 C29a) and the other from the Arthur Kill (Kill-XIV). Dating sediment cores is the most important step in analysis, and using radiometric Cs-137 dating and concentrations and ratios of platinum group elements (PGE) we have reconstructed key portions of the sedimentary chronology. Elevated PGE ratios at depth 30 cm and 34 cm in Kill-XIV indicate changes in ore sources or production methods that could be used as time markers in all NY Harbor sediments, and Cs-137 dating CD-02 29a reveals cesium until approximately 50 cm. Furthermore, PGE concentrations measured in Kill-XIV illustrate elevated platinum concentrations before the time period of catalytic converters, the first such NY Harbor discovery, which holds potential as an additional stratigraphic marker in NY Harbor sediments.