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Investigation of Sediments from New York Harbor Using Fourier Transform Infrared Radiation (FTIR) Spectroscopy

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Sediments in the NY/NJ are contaminated with trace amounts of polynuclear aromatic hydrocarbons (PAH's), polychlorinated biphenyls (PCB's) dioxins, furans, and metals from different anthropogenic sources. The sediments also include substantial amounts of other organic materials that comprise 1-10% of the sediment mass. These materials include both naturally occurring and anthropogenic compounds.

The objective of the present work is to investigate the nature of these organic materials as found in the National Institute of Standards and Technology Standard Reference Material (SRM) 1944, New York/New Jersey Waterway Sediment. Compounds extracted from the SRM with water, alcohol, and hexane were filtered to fractions less than .0025 and .0005 mm, dried on a slide and examined using FTIR. The resulting spectra gave information on the functional groups of the compounds. High-resolution maps of the sample material showed that there was marked heterogeneity on scales less than .025 mm. The information gained here will help in understanding the relationship between the organic materials and the sediment clays and silts and the ways in which metals partition between organic and inorganic components of the sediments.