

The urban geochemistry of Wethersfield Cove, Hartford, CT

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Wethersfield Cove (WC) and adjacent Keeney Cove (KC) are old arms of the Connecticut River created during the floods of 1692. Both are depocenters of fine-grained material as a result of 'tidal pumping'. A waste-water treatment plant (WWTP) has had repeated overflows into WC, e.g., 20 million gallons of sewage in 1997. Sedimentation rates in the coves are ~1.4 cm/yr, based on ²¹⁰Pb and ¹³⁷Cs dating. The core bottoms consist of sandy layers of the 1936-1938 floods. Three WC cores and one KC core were analyzed by DMA for Hg and by WD-XRF for 30 trace elements. Cores in WC have severe mercury pollution (up to 4 ppm Hg) between the 1930s and 1960, then dropping off rapidly. Organic matter is a mixture of algal and terrestrial carbon, based on C/N, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$ and the VGI index (Kruge). Other metal pollutants peak in the late 1970s (Pb), 1950s (Cu, Zn, Cr), and V in the mid-1980s. Arsenic concentrations are modest (15-20 ppm) and Cu, Pb and Cr concentrations exceed 300 ppm. Potential sources for these metals are WWTP effluents, but Hg may at least in part be derived from the Hg-boiling power plant just north of the coves. The plant was operated until the early 1960s, recorded large Hg losses (>40,000 lbs) in 1930-1940, and may have been a source of Hg for the Connecticut River and ultimately for Long Island Sound. Stable Hg isotope studies to trace the Hg sources are ongoing (Martini *et al* this conference).