

TRACKING MERCURY CONTAMINATION IN THE SEDIEMENTS OF WESTERN LONG ISLAND SOUND

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bia, Missouri

We measured the concentrations of mercury (Hg) in the sediments of western Long Island Sound to assess the impact of anthropogenic activities. Results show that the concentration of pollutants such as Hg in western Long Island Sound is to a great extent controlled by physical processes that erode, transport, and focus sediment deposition at particular locations. The data that forms the basis of this study was collected during June 22-29 of 2006 from the *R/V Hugh Sharp* (Fig.1). We surveyed western Long Island Sound and collected multibeam bathymetry, chirp sub bottom profiling, side-scan sonar imagery and sediment samples (25 gravity cores, 11 multicores and 10 grabs). The acoustic images provided the framework within which to sample five of the gravity cores for the purpose of determining Hg (mercury) contamination. Cores HS06-2G and HS06-15G were recovered in a region of flat topography at 29.1 m and 15.2 m water depth, respectively, in the eastern part of the study area, near the Connecticut shoreline. Cores HS06-21G, HS06-22G and HS06-24G were recovered east and west of the main navigation channel (water depth of 12 to 16.7 m) near the Throgs Neck Bridge, in the western part of the study area (Fig. 2). Samples were run through a mercury analyzer (~10-12% \pm accuracy) at Wesleyan University. Cores located in closer proximity to the CT shoreline showed two distinct spikes in the abundance of Hg that represent the start of the Industrial Revolution in ~1850 and possibly the 1938 hurricane. The cores recovered at the margins of the channel show very different Hg concentrations, even though they are 100 m apart. These differences can be linked to physical processes. Cores 24G and 21G located in an area of sediment erosion or non-deposition show one spike with low Hg concentrations of 122ppb and 530 ppb, respectively. In contrast core 22G located in an area of sediment deposition shows Hg concentrations increasing from ~50ppb at a depth of 50cm to ~1500ppb at 5cm. Bedrock and tidal currents of velocities of ~10 cm/s are important factors controlling the channel morphology and sedimentation patterns therefore influencing the preferential accumulation of contaminants. The source or sources of Hg will be investigated in the near future.

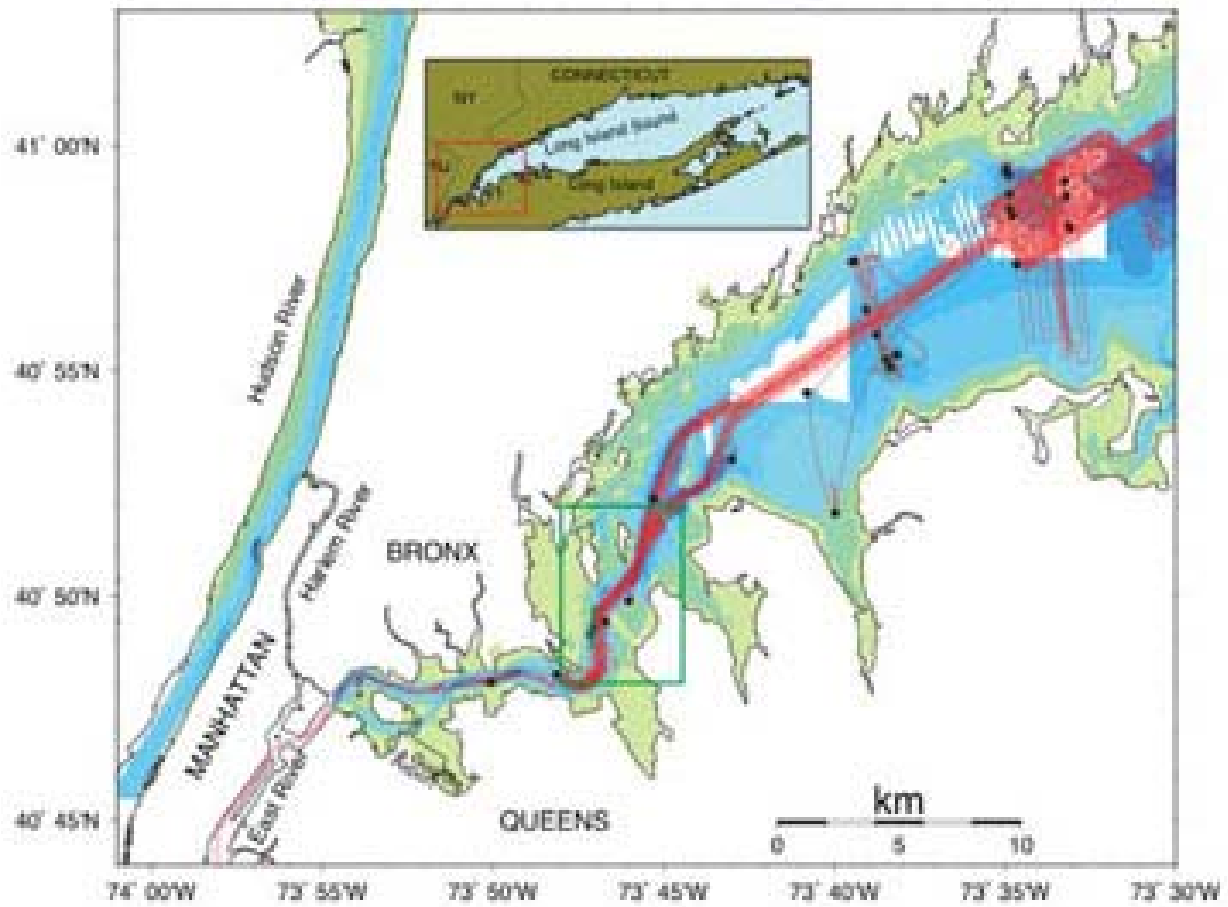


Fig. 1. Location of study area in western Long Island Sound. Red lines mark the navigation tracks of the R/V Hugh Sharp. Black dots mark the sampling stations.

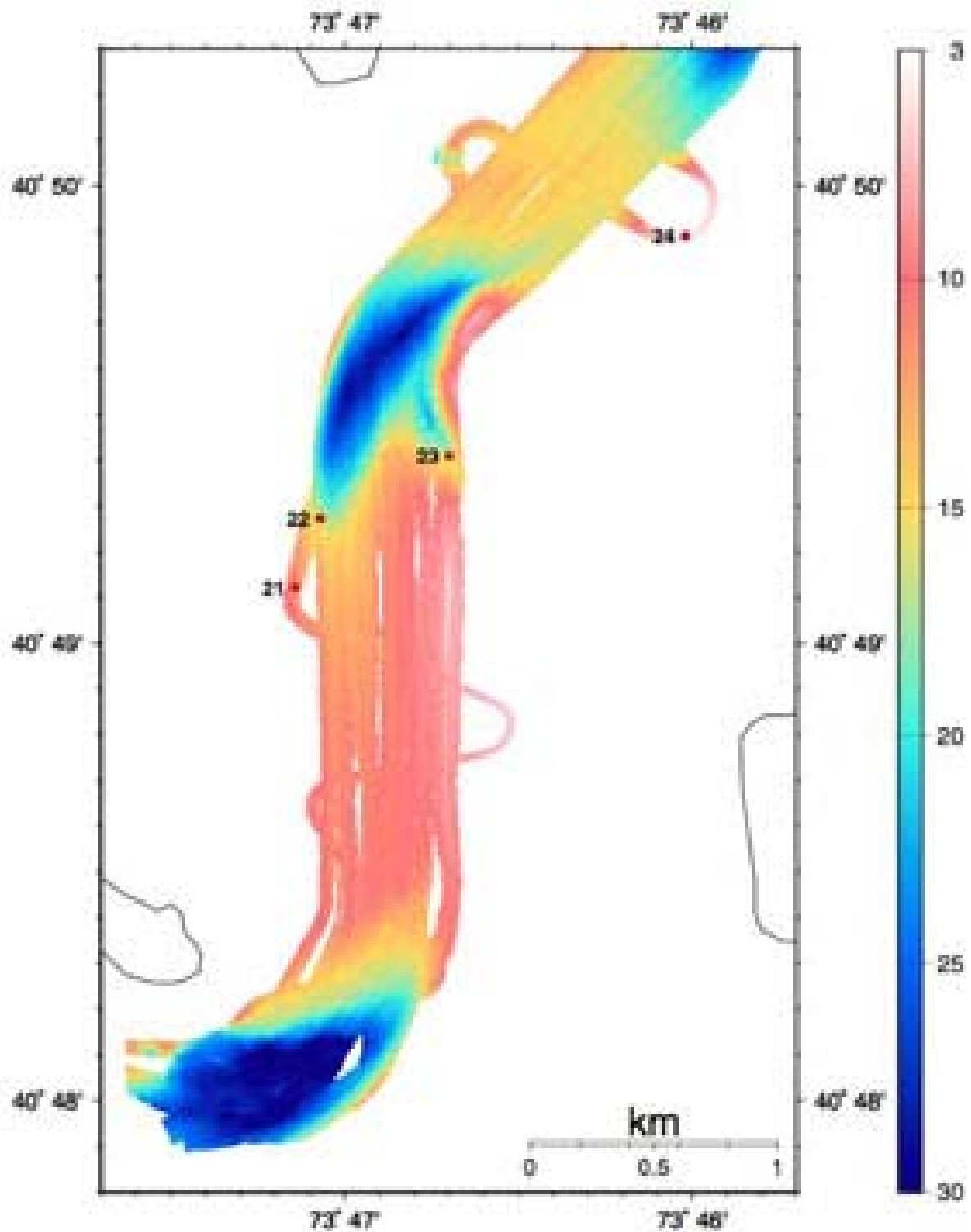


Fig. 2. Multibeam bathymetry of the main navigation channel beneath the Thoggs Neck Bridge showing location of gravity cores, outcropping bedrock, bends along the path of the channel, and areas of sediment deposition and erosion.