Can We See Dust from the 1992 Fall of the Peekskill Meteorite in Hudson River Sediments and Can We Use It as a Stratigraphic Marker?

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We have been studying the stratigraphy of core LWB4-1 taken in 2001 in the Hudson River about 100 meters north of the calculated transit path of the Peekskill meteorite in October 1992. We measured magnetic susceptibility at 1 cm intervals from 0-70 cm depth and found a layer with a magnetic susceptibility of 11 cgs units at 6 cm depth. This is the highest susceptibility in the top 40 cm of the core. Scanning X-Ray Fluorescence spectroscopy revealed that the high susceptibility layer at 6 cm depth is part of a 3 cm interval with a high Ni/Cr ratio, but the depth of the peak in the Ni/Cr ratio is poorly resolved due to measurement error. We plan to dry and homogenize discreet samples for analysis on bench top XRF to reduce Ni and Cr error. Based on our identification of the base of modern Pb at 68 cm depth, the top 40 cm of the core covers the time interval from 2001 to ~1930. From previous work on Central Park Lake, the base of modern Pb represents the year 1880 A.D. A uniform sedimentation rate model is supported by a peak in lead (Pb) and arsenic (As) at 8 cm depth. The peak might represent the 1988 ban on the use of lead arsenate and the start of the use of DDT as a pesticide. We found a second peak in Pb at 37.5 cm potentially from 1938, the date at which incineration was banned in New York City. We found a third peak in Pb at 50.5 cm that might be from World War I around 1914. We found two deeper susceptibility peaks of 12 cgs at 43 cm and 8 cgs at 59 cm. These peaks could represent major Hudson River floods in 1927 and 1903. ^{137}Cs and ^{210}Pb 210 dating are in progress and will help us to determine if our age model is correct. Also, our core exhibits a distinct increase in Ca content starting at 18-25 cm depth and increasing towards the top of the core. This increase could be due to increased erosion, anthropogenic inputs or increased dissolution of $CaCO_3$ rich rocks. We are measuring $CaCO_3$ in the core to better determine the origin of this increase of Ca.