

Regional and Local Stratigraphic Markers in Three Hudson River Cores Taken Near Peekskill, New York: Core LWB 4-5

Abdul, B.; Adeghe, S.; Diallo, M. B. H.; McCann, B.; Abbott, D. H.; Bostick, B. C.; Chang, C.; Block, K. A.

Abstract

We have been studying the stratigraphy of core LWB 4-5 taken in 2001 in the Hudson River 1.5 km north of the transit of the Peekskill meteorite in October 1992. We measured magnetic susceptibility and elemental composition at 1 cm intervals down to 50 cm and then at 5 cm intervals down to 108 cm. Magnetic susceptibilities are unusually high (above 20 cgs units) from 12-19 cm and again at 31 cm. The level at 31 cm contains mm-sized fragments of Fe oxide. X-Ray Fluorescence spectroscopy revealed high Ni/Cr levels concentrated from 9-11 cm and again below 97 cm. We found tektite-like spheroids, dumbbells and teardrops from 8-15 cm depth. They are glasses and they contain appreciable K, consistent with an origin as true tektites but we have not identified the source. Overall, we interpret the high susceptibility, high Ni/Cr and possibly tektite bearing layer as a resulting from the fall of one of the bodies postulated to have fallen with the Peekskill meteorite in 1992. A 1992 age for the top of the Peekskill layer at 8-9 cm depth is consistent with a uniform sedimentation rate in the core and the occurrence of the base of modern Pb at 97 cm depth. From previous work on cores from Central Park Lake, the base of modern Pb represents the year 1880 A.D. We also found other prominent horizons whose ages fit a linear sedimentation rate model. We found a step change in As/Pb ratio whose inferred age matches 1988, the year when Pb and Cu arsenide were banned as pesticides. Our core exhibits peaks in Ca and Sr content and a minor susceptibility peak at 17.5 depth that may represent the 1980 "Great Catskill Toilet Flush" Hudson River flood event. The Catskills contain abundant marine limestone that could serve as a source for Ca and Sr. A prominent susceptibility peak at 37.5 cm could represent a flood in 1955. We also found a peak in Pb at 50 cm depth whose inferred age matches that of the cessation of incinerator burning in 1938. ¹³⁷Cs and ²¹⁰Pb ages are in progress and may be available by the time of the meeting. The high Pb and As levels in parts of LWB 4-5 are supported by examination of the coarse fraction. We found two bright orange grains, both with carbon rich coatings. One grain analyses on the X-ray analyzer of an SEM as 8%C, 70% Pb, 17%As and 2% Cu. The second grain analyzes as 10% C, 43% Pb, 1% Ca, 2% P, 27% As, 4% Fe, 2% Ni, 1% Si, and 6% Zn. All analyses are in wt.% on an oxygen free basis.

Publication:

American Geophysical Union, Fall Meeting 2018, abstract #B53I-2167

Pub Date:

December 2018

Bibcode:

2018AGUFM.B53I2167A