Lima, A.L., Bergquist, B.A., Boyle, E.A., Reuer, M.K., Reddy, C.M. and Eglinton, T.I., *High-resolution historical records from Pettaquamscutt River basin sediments. 2. Pb isotopes reveal potential new stratigraphic marker*, Geochemica Cosmochimica Acta, 2005; v69, 1813-1824

A high-resoln. record of Pb deposition in Rhode Island over the past 250 yr was constructed using a sediment core from the anoxic Pettaquamscutt River basin. The sedimentary Pb concn. record shows the well-described max. assocd. with leaded gasoline usage in the US. Diminished Pb variability during recorded periods of local industrial activity (1735 to 1847) supports the greater importance of regional atm. lead transport vs. local inputs. The Pb isotopic compn. at this site shows a clear max. in anthropogenic 206Pb/207Pb in the mid-1800s. Similar peaks have also been obsd. in sediments from Chesapeake Bay and the Great Lakes, suggesting a common source. Possible causes for this event include mining and smelting of Pb ores in the Upper Mississippi Valley district, which accounted for almost all Pb prodn. in the US in that period. The timing of this event can provide an important stratigraphic marker for sediments deposited in the past 200 yr in the northeastern US. The downcore profile of anthropogenic 206Pb/207Pb provides a classic example of how changes in the mixt. of ores for prodn. of tetra-Et lead caused a regional-scale shift in the sedimentary record, and suggests that coal could have played a secondary role in Pb emissions after 1920.