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Particle Size Dependence of Heavy Metal Concentrations in the Lower Meramec River, Missouri, USA, Originating From Legacy Lead Mining

Lead (Pb) mining began in the mid-18th century within the “Old Lead Belt” of southern Missouri, USA. This region was the largest producer of lead ore worldwide from approximately 1869 to 1972. Both unused ore and waste products were discharged directly into the Big River watershed. Particles containing heavy metals varied significantly in size, corresponding to the geologic equivalent sizes ranging from clay to cobble. Flood events have transported and mixed these materials through the watershed and over 100 km downstream into the lower Meramec River, a tributary of the Mississippi River which flows through suburbs of St. Louis, MO.

Elevated Pb levels (> 100 ppm) are documented for sediment deposits near the banks of the lower Meramec River after overbank deposition do to high discharge events. The concentration of Pb is examined as a function of the particle size using wet-sieving, laser diffraction, and X-ray fluorescence. Discussion regarding both techniques and results will be presented.