

# Using $^{137}\text{Cs}$ and $^{210}\text{Pb}$ to Investigate Recent Historical Sedimentation Records of Heavy Metals in River Floodplains

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**Abstract:** Heavy metals contamination is an important environmental concern that has received growing research interest. The concentrations of heavy metals have been measured and analyzed in different environments. In this study, five sediment cores were collected from river floodplains to investigate recent historical sedimentation records of heavy metals. Radionuclides were used to establish chronologies for each core and hence provide overbank sedimentation information using  $^{137}\text{Cs}$  as an independent time marker for the last 46 years, and using  $^{210}\text{Pb}$  measurements and the composited CRS model for the last 100 years. Ten heavy metals, including Fe, Co, Ni, Cu, Zn, Cd, Sn, Sb, Pb and Bi were measured in the different depths of sediment to reflect their concentration in sediments deposited during various periods. Relationships between sedimentation rate and heavy metals, and correlations among different heavy metals were analyzed. These results demonstrate that generally, most heavy metals concentrations were relatively uniform in sediments deposited during different times, but some heavy metals varied greatly. Few statistically significant correlations among heavy metals were found. The changes in heavy metal concentration are probably a reflection of changes in land use or in watershed management of upper reaches. These results enable heavy metals concentration to be placed into a historical context and provide a reference to the future potential management of land use and soil erosion control.

**Key Words:** Radionuclide, Heavy Metal, Sedimentation, Historic Concentration

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