Sedimentary record of environmental contamination in antimony over the Industrial Revolution: the case study of Meria valley (France)

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Over the last two centuries, mining activities have produced anthropogenic aerosols enriched in metals or metalloids (As, Sb). In this study the geochemical composition of continental sediments is measured to highlight the anthropogenic contamination due to the exploitation of antimony-bearing ores along the NE coast of Corsica. Sediment cores have been retrieved by gravity and piston coring along a 2 km W-E transect from the old Meria mine downward the coast in order to record the timing and spatial distribution of the pollution. Major and trace elements concentrations have been measured by mass spectrometry (ICP-MS), neutron activation (INAA) and XRF core scanner in order to have continuous data. The chronological framework is derived from ^{14}C, ^{210}Pb and ^{137}Cs data. At 2 km downstream the mine a 1.5 m gravity core covers the 300 years and is characterized by a high concentration of Sb (300 to 1800 ppm) and As (100 to 300 ppm). Their maximum concentration is consistent with the opening of the mine (70 cm, 1835 AD). However the metal contamination remains high even after the closure of the mine (1913 AD), suggesting persistent contamination due to reworking and erosion of mining wastes for more than 50 years.