Geophysical Research Abstracts, Vol. 9, 10689, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-10689

Geochemistry of sediment trace metals from both the urban Adour estuary and a mud-patch developed to the southwestern part of the continental shelf of the Bay of Biscaye

G. Bareille (1), D. Amouroux (1), O. Weber (2), J-M Jouanneau (2) & O. F.X. Donard (1)

(1) IPREM UMR CNRS 5254 LCABIE, Université de Pau et des Pays de l'Adour, France, (2) UMR CNRS 5805 EPOC, Université de Bordeaux I, France (gilles.bareille@univ-pau.fr / Phone : 33 (0)5-59-40-77-61)

In aquatic environments, trace metals largely interact with both fine-grained suspended, colloidal materials and phytoplankton and zooplankton through adsorption and bioaccumulation processes and subsequently be added by deposition to the streambed. Bed sediments from both estuarine and continental shelf areas can then integrated conditions over a longer time, recording changes in environmental variables and human-related activities such as improvements in wastewater handling and sewage treatment according to legislation and the alteration of industrial activities. The measured concentrations of deposit-related trace metals in bed-sediments may also vary because of biogeochemical processes that occur either in the water column (adsorption/desorption) or at the sediment-water interface through primary diagenetic redox reactions driven by degradation of organic material at the sediment-water interface and a number of physical post-depositional.

In this study, down-core sediment samples from a mud-patch located on the continental shelf of the Bay of Biscaye to the southwest of Bayonne, were compared to a core located in a salt marsh area from the Adour estuary. The Adour estuary, southwestern part of France, has experienced large human related modifications associated to harbour extension and urban and industrial development since several decades. We examined to what extent trace metal levels recorded in the mud-patch during the last century are linked to detrital inputs from the Adour estuary and others Basque bay

or to primary diagenetic redox reactions. For that purpose, sediment sample were digested in PTFE Teflon bombs using a closed microwave oven (Multiwave 3000, Anton Paar) and analyzed for trace metals Mn, Cr, Zn, Cu, As, Pb, Co, Cd, Ag, V and U by ICP-MS (Elan 6000, Perkin Elmer). ^{210}Pb in excess was used to calculate sedimentation rates. Results indicated higher trace metals Cu, Zn, Cd and Pb levels for the last forty years in the two sites, probably in relation to increased industrial activities following 1950. Nevertheless, correcting values for carbonate dilution in the mud-patch the observed values should not be originated primarily from the Adour estuary. In addition, taking into account of the strong correlation recorded between Mn and Cu, Zn, Cd and Pb, we suggested that redox reactions are driving the observed profile which is not the case in the Adour estuary salt marsh.