

## **Balance Transfer of Heavy Metals in Marine Environments Subject to Natural and Anthropogenic Inputs: A Case Study on the Mejerda River Delta**

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**Abstract :** Sedimentation rates and total fluxes of heavy metals (Fe, Mn, Pb, Zn and Cu) was measured in three different depths (10m, 20m and 40m) during March and August 2012, offshore of the Mejerda River outlet (Gulf of Tunis, Tunisia). The sedimentation rates are estimated from the fluxes of the suspended particulate matter at 7.32, 5.45 and 4.39 mm y<sup>-1</sup> respectively at 10m, 20m and 40m depth. Heavy metals sequestration in sediments was determined by chemical speciation and the total metal contents in each core collected from 10, 20 and 40m depth. Heavy metals intake to the sediment was measured also from the suspended particulate matter, while the fluxes from the sediment to the water column was determined using the benthic chambers technique and from the diffusive fluxes in the pore water. Results shown that iron is the only metal for which the balance transfer between intake/uptake (45 to 117 / 1.8 to 5.8 g m<sup>2</sup> y<sup>-1</sup>) and sequestration (277 to 378 g m<sup>2</sup> y<sup>-1</sup>) was negative, at the opposite of the Lead which intake fluxes (360 to 480 mg m<sup>2</sup> y<sup>-1</sup>) are more than sequestration fluxes (50 to 92 mg m<sup>2</sup> y<sup>-1</sup>). The balance transfer is neutral for Mn, Zn, and Cu. These clearly indicate that the contributions of Mejerda have consistently varied over time, probably due to the migration of the River mouth and to the changes in the mining activity in the Mejerda catchment and the recent human activities which affect the delta area.

**Keywords :** delta, fluxes, heavy metals, sediments, sedimentation rates

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