Assessment of reactivity and mobility of MTE in surface sediments in Morbihan Coast (South Brittany, France)

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The aim of this study is to evaluate the mobility of MTE in surface coastal sediments of the Bay of Quiberon and the Gulf of Morbihan (South Brittany, France) in relation to anthropic forcing (harbor pollution). Local coastal sediment is composed of a matrix of low reactivity old eroded minerals from the Hercynian chain (over 300 Million years old) and clays accumulated from coastal transport. Recent development of agriculture and yachting contaminated surface sediments with MTE from paint coatings and other pollutions. Organic matter accumulates also in harbors and protected areas. To evidence potential geochemical interactions between these components, we analyze 52 samples distributed over the area using multiple single extractions.

The chemical partitioning is divided in five operationally defined fractions (exchangeable/carbonate, Fe/Mn oxides, organic matter/sulfide, acid soluble, residual).

Principal component analysis on the results of each leaching method would indicate mixed sources for MTE distribution, depending on the location: yachting paint pollution, organic matter content, sediment anaeroby (traced by U enrichment) and sediment size fractionation.

The detailed distribution analysis is in progress. It seems to show very different distributions of elements that will be associated to environmental parameter. A preliminary distinction is apparent between mobile and bioavailable elements such as As, Cd and Zn and unreactive metals such as Sn possibly associated with heavy minerals.