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Spatial variations of mercury in sediments of Aviles Harbour and its implications on dredging

Efrén García Ordiales[1], Mario Mangas[1], Lorena Sanz-Prada[1], Elena Pavoni[2], Stefano Covelli[2], Nieves Roqueñí[1], Jorge Loredo[1], and Pablo Cienfuegos[1]

[1]ISYMA, Univeristy Of Oviedo, Mining, Energy and Materials Engineering School, Mining Exploitation and Prospecting, Oviedo, Spain (garciaefren@uniovi.es)

[2]Department of Mathematics and Geosciences, University of Trieste, Trieste, Italy

Aviles estuary is one of the most impacted estuaries of the north of Spain. In its margins, there are several heavy industries such as steel, zinc and aluminium factories together with other little factories dedicated to secondary metallurgical products. Because of the intense metallurgical activities developed in the area, sediments of the estuary show an important metal load. Among the different heavy metals present in the estuary, Hg in one of the most important due to its toxicity and potential transference to biota. To study the Hg concentrations present in the estuary, 52 scattered samples were collected. Samples were analysed for total Hg, and other parameters such as grain size, organic matter and sulphur have been determined. Total Hg concentration in the estuary sediments ranged between 0.1 to 18.3µg g^{-1} with an average of 4.3 µg g^{-1}. The particle size of the sediment governed the mercury dispersion in the estuary. In the inner part where silt and clay fraction are predominant, Hg showed the highest values while in areas where sands predominate Hg concentrations decrease. The Hg concentration in a total of 36 samples exceed the probable effect level established by NOAA, which suggest that Hg may be transferred to the biota of the estuary and could be a problem for the health status of the area. On the other hand, concentrations of 26 samples were above the C level of the Spanish dredging regulations, limiting its management to encapsulation in non-vulnerable areas or its management as waste by an authorized manager.