

NATURAL RADIONUCLIDES AS TRACERS OF BEACH SEDIMENT DYNAMICS: A STUDY IN A HETEROGENEOUS ENVIRONMENT

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Abstract: Natural radionuclides have been used as tracers of sediment dynamics in coastal areas before (Thereska 2009, Dai et al, 2011) and therefore they present an interesting tool to evaluate sedimentary processes in coastal areas. To enhance the knowledge of natural radionuclides as tracers of erosion and accumulation periods in beach and coastal areas, a spatio-temporal analysis of the activity concentrations of natural radionuclides in sand samples was performed in Las Canteras beach (LC), Spain, during 2016 and 2019. This beach was selected because it combines two different dynamics; one of a closed beach, and thus protected against the wave action, and that associated with a beach open to it. Moreover, the sediment dynamics of this beach has been well studied before (Alonso, 1992). Therefore, Las Canteras beach is a suitable natural laboratory to evaluate the use of natural radionuclides as tracers of beach sediment dynamics under different marine dynamics. The results of the spatial analysis showed that the activity concentration of ^{226}Ra , ^{228}Ra , ^{40}K group the samples in three clusters that agreed with three different zones related to the sediment distributions occurring due to the different sediment dynamics present in the beach. The temporal analysis seemed to prove that the activity concentrations of the radionuclides studied were influenced by erosion and accumulation agents such as significant wave height. Moreover, submarine sand samples from El Confital Bay, where LC is located, were also analysed in order to evaluate if the origin of the sediments that arrive and move along the beach are also traced by natural radionuclides.

Key words: Natural radionuclides, beach, tracers, erosion and accumulation

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