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Nationality: Spanish

Date doctoral degree: 13/07/2017

Orientation: Ocean Observation and Global Change

Specialization Area: Ocean Observation

Research Area: 1.1 Physical Oceanography

PhD project: Continental contributions to coastal zone: natural and antropogenic disturbances in biogeochemical river flows and their traceability in the sedimentary compartment



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Summary: The continental contributions of matter driven by small rivers, is a developing topic to be considered by the scientific community. This Dissertation presents four already published studies focused on the Galician Rias, a coastal area dominated by small rivers inputs. Using trace elements as geochemical markers and other environmental indicators, the continental transport was characterized, quantified and assessed in the land-ocean boundary. Useful background levels to be considered from a local to the global scale, for water dissolved and particulate loads and estuarine sediments, are provided. Some of the surveyed rivers were classified as pristine or uncontaminated, which can be considered between the short European list of clean rivers (i.e. the Das-Mestas River, Ria of Cedeira; The Mera River, Ria of Ortigueira; and the Landro River, Ria of Viveiro). Natural enrichments caused by the local lithology were identified, as those of Co, Cr, Ni and V with origin in the Cape Ortegal Geological Complex; this fact highlights the necessity of considering local peculiarities when environmental assessment is addressed. Some human disturbances were detected such as the impact in the coastal area of treated and untreated wastewater effluents (e.g. enrichments of Cd, Cu, Pb, Zn, nutrient salts and organic matter); likewise, the impact of the construction of dams (retaining within the reservoir the geochemical fluxes), urbanization, changes in land uses, automotive traffic and mining activities. The analysis and interpretation of sediment cores allowed to place the beginning of the industrialization after the Spanish Civil War (mid-20th century); therefore, the time when can be noticed the imprint of the proposed Anthropocene epoch in the northwestern coast of the Iberian Peninsula. Besides the four research articles, a brief of a forthcoming publication is presented, it deals with a two-moments environmental assessment of a sensitive area, showing the success of the environmental regulations assumed in the first years of the 21st century.