

Caroline Costa Ferreira
University of Aveiro
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Orientation: Ocean Observation and Global Change
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PhD project: **Sediment Transport in Coastal Environments with Mixed Sand Bends**

Supervisors: Dr. Paulo Manuel Cruz da Silva (University of Aveiro)
Dra. Ana Maria Bernabeu Tello (University of Vigo)

Summary: Sediment dynamics is a complex subject, playing an important role in coastal areas. The interaction between the wave action and sediment particles is determinant to understand sediment transport. The knowledge of sediment transport in sand mixtures is relevant as the coastal zone usually presents large heterogeneities of sediment particles sizes in the horizontal and vertical directions, which denote the existence of selective transport process. The goal of the present study was to understand selective sand transport mechanisms associated with wave-dominated conditions. To achieve the proposed objective, the work was supported by several approaches to give insights into the processes associated with heterometric sediment transport. The first approach consisted in a review of the literature to understand what is known and the lack of knowledge in the subject. The second approach consisted in performing a set of experiments with fluorescent sand tracers in natural conditions, at the field, and in a controlled environment, at the laboratory. The experiment conducted at Patos beach, Spain, aimed to observe the behavior of the native sand in the natural environment. The one performed at a large wave flume (*Großer Wellenkanal*, GWK) in Hannover, considered distinct sediment mixtures under two wave conditions. In both, measurements of the total and fractional transport were made. Finally, a quasi-steady and a semi-unsteady model were considered to calculate the net sediment transport of a large data set, for uniform and graded sand, allowing to identify limitations of the models and to propose new methodologies to obtain more adequate results coastal environments.

