IST – LNEC Joint doctoral Initiative

Dissertation Proposal

TITLE: Performance of shoreline evolution strategies

Short Description

The Portuguese western coast has high shoreline erosion rate, and several measures to control the shoreline position have been implemented in time and at different locations in the last decades, following the Coastal Management Plans. These plans have also been guided by changing trends in coastal protection schemes and actions, such as from a hard-protection concept to a soft-protection and sand nourishment concepts.

These different strategies can and should be supported by shoreline modelling results, which need further development and validation to accommodate new coastal protection structures, such as shoreline-parallel submerged breakwaters.

Simultaneously, freely available remote earth observation data can be used to extract past (in the last 20-30 years) and present shoreline position data at a frequency much greater than that generally available by other methods (e.g., aerial photogrammetry).

This research will focus on evaluating past and present coastal protection measures and coastal evolution on stretch of the Portuguese western coast, addressing the following issues: inter-annual and seasonal wave climate variability, the role of different coastal protection structures, wave propagation from deep-water to nearshore region, one-line and multi-line shoreline modelling, improved longshore sediment transport formulae, sources and sinks in coastal cells, history effects in long-term shoreline evolution estimates, sand nourishment strategies.

Keywords: shoreline, beach nourishment, remote sensing data, coastal protection schemes

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