



Identification of the effects of recent tidal regime changes in intertidal areas of the Ria de Aveiro, Portugal, using airborne and surface observations

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The Ria de Aveiro coastal lagoon of northern Portugal has changed from fluviially to tidally dominant in response to maritime works undertaken progressively since 1808. The water column conditions have responded rapidly to the changes in tidal forcing, while the bottom compartment has responded slowly. The aim of this work is to identify the ongoing changes in the bottom sediment and vegetation at key intertidal locations in the Ria de Aveiro. Airborne observations of these areas, made from a low altitude, were combined with surface sampling of sediment and vegetation, to aid the interpretation of the remote sensing images. Both types of observations also provide important information for the evaluation of vegetation change over time, allowing the interpretation of existing images obtained by conventional methods, namely standard aerial photographs at 1: 25000 scale and images from earth observation satellites. The observations made in 2005, in intertidal areas near Aveiro, were compared with aerial photographs from 1998. A reduction in the area covered by green macroalgae was observed together with a large increase in intertidal areas with unvegetated sediment and also new areas colonised by the seagrass *Zostera noltii*. The observations suggest that the lagoon ecosystem is adjusting slowly to the new tidal conditions. The areas with *Z. noltii* will retain sediment while the unvegetated areas tend to loose the fine fraction and evolve to mobile sand banks.