

COUPLING WATERSHEDS, ESTUARIES AND REGIONAL SEAS THROUGH NUMERICAL MODELLING FOR WESTERN IBERIA: REGIONAL SEA SURFACE SALINITY PATTERNS.

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RESUMO

In western Iberia, the relatively recent description of a significant regional feature associated to fresh water inputs increased the attention to this subject from the oceanographic point of view. The Western Iberia Buoyant Plume (WIBP; Péliz *et al.*, 2002) is an all-year-round low salinity water lens that extends along the Northwest Iberia coastal area due to the accumulation of several fresh water sources, such as the Douro, Minho and Mondego rivers along with other smaller rivers and the Galician Rias. According to Brito *et al.* (2015), the area comprised between the Mondego and the Minho River receives around 45000 Hm³y⁻¹ corresponding to 55% of the total volume of water discharged in the Portuguese coast. Since its first description, the WIBP has been the subject of the several research studies related to ocean productivity and larvae and eggs dispersal.

The main objective of the present research was to explore the capacity to improve the thermohaline circulation in coastal areas by a better characterisation of the land-ocean boundary conditions, with special regard to the salinity fields. In this work, the impact of the discharge of 44 rivers, eight of them implemented through estuarine fluxes estimated by numerical model applications, in a regional model for western Iberia were analysed for the period 2011-2015.

The applied methodology, described in Campuzano *et al.* (2016), recreated the water cycle from the rain water to the open ocean with numerical models coupled using an offline technique. The different components of the system, including watersheds, estuaries and regional ocean, for Western Iberia were reproduced using numerical models of the MOHID Water Modelling System (<http://www.mohid.com>). Modelling results served to study seasonal and interannual evolution of the sea surface salinity known features including the Western Iberia Buoyant Plume (WIBP) and to describe a new seasonal joint plume resulting from the Tagus-Sado estuaries designated as Western Iberia Central Plume (WICP). Modelling results were used, in combination with observed data, to analyse an extreme runoff event during April 2013.

Palavras chave: salinity; numerical modelling; MOHID; plumes; WIBP; Western Iberia; extreme event.