



Upwelling intensification and relaxation off central Portugal in summer 2005 from satellite data and numerical models

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Satellite-derived sea surface temperature (SST) and chlorophyll-a (Chl-a) concentration maps are used together with numerical models to study the circulation patterns observed during the summer 2005 off central Portugal, a region characterized by a complex coastline and bathymetry. A set of ocean (Regional Ocean Model System - ROMS) and Atmospheric (Weather Research and Forecasting - WRF) model configurations with online and offline nesting were used to conduct realistic simulations for the period. Two cycles of intensification and relaxation of the NS wind component occurred in late June, early July and late July, early August, embedded on the typical summer northerly wind regime. During upwelling intensification, satellite data show a SST decrease in the shelf areas north of Cape Roca, which is less pronounced in the bays south of the Cape, specially in Setúbal bay where warm temperatures persist throughout the intensification and relaxation cycle and Chl-a concentrations are low. The model results show a good comparison with the satellite-derived SST spatial and temporal patterns. The major features reproduced in the model solutions are the strong along-slope flows, the development of filaments and separated jets, the frontal-scale instability and the rapid onset of coastal counter currents along the inshore zone during relaxation.