



Improving coastal resource management surrounding the northwestern Iberian Peninsula under present and future climate conditions: statistical evaluation of climate models for development of a dynamic downscaling

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One of the main objectives of the MarRISK project is to perform a dynamic downscaling of the global model outputs from IPCC-CMIP5 (Phase 5 of the Coupled Model Intercomparison Project) in order to obtain fine-scale climate change projections for ocean variables such as currents, salinity, temperature, waves and sediment transport in the seas surrounding the western Iberian Peninsula (Iberian Atlantic Margin). Here, the global models' performance in representing the present-day climatology of these variables is evaluated. To this end, a comparison to observations from the World Ocean Atlas is carried out and the differences in the mean (BIAS), higher percentiles and standard deviation, as well as in the empirical distributions (two-sample Kolmogorov-Smirnov test) are calculated.

For the historical period from 1955 to 2004, our results indicate that individual models are not capable to reproduce the temperature and salinity patterns of the Iberian Atlantic Margin. The ensemble average of the CMIP5 models better fits the observed climatology. In our area of interest, a maximum BIAS of $\pm 2^{\circ}\text{C}$ is obtained for Sea Surface Temperature (SST) and ± 0.5 psu for Sea Surface Salinity (SSS). For the future period from 2071 to 2100, positive SST trends and negative SSS trends are found. The magnitude of these trends is larger under RCP8.5 than under RCP4.5 forcing.