Predicting in a turbulent environment: The Iberian-Biscay-Ireland Copernicus Marine Forecasting System

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The present study is aimed at intercomparing the ocean physical daily forecast and 10-year (2002-2012) reanalysis products provided by the Iberia-Biscay-Ireland Monitoring and Forecasting Center (IBI-MFC), in the framework of the Copernicus Marine Environment Monitoring Service (CMEMS), over an overlapping 9-month period (April-December 2011). These two products differ in their spatial resolution and in the use of an observational data assimilation scheme in the reanalysis. Both modeled solutions are compared at regional and local scale against several observational data sources. At regional scale, the forecast and reanalysis show realistic patterns in the area of study. However, at finer scales the results highlight better performances of the 1/36º forecast in coastal areas and the 1/12º reanalysis over open waters. The comparison emphasizes the possible benefits of the data assimilation scheme in areas away from the coastline, but also its limitations in complex coastal regions. Spatial resolution seems to play a key role in such areas, especially around the Iberian Peninsula, where the higher resolution forecast brings in general better results than the coarser resolution reanalysis. The study suggests that the observational data assimilation represents a crucial step towards improving the performance of regional modeled solutions, as long as the spatial resolution is kept at fine-enough meshes in order to prevent higher uncertainties in coastal and shelf areas.