IBISAR downstream service: Lagrangian assessment of CMEMS and regional model products supporting emergency decision-making at sea.

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According to the Spanish Maritime Safety Agency, in average almost 99 people per day were assisted during 2017 in their SAR (Search and Rescue) responsibly areas. This is more than twice of the previous year, mainly due to the dramatically increase of the human migration. Also, a total of 310000 people were assisted during its 25-year operation. Following the upward trend in recent years (five times more assistance of migrants, in 2017 to compare with 2013), it seems that those numbers will unfortunately continue to grow, making the SAR agencies operations increasingly crucial in the next coming years.

In order to support their decisions, government agencies and private companies supporting maritime safety and coastal and marine environment activities, rely on SAR and environmental risk modelling applications. These tools, mostly based on Lagrangian models, require the computation of trajectories, whose reliability ultimately depends on the accuracy of current and wind provided by forecast models and observations.

Addressing targeted users needs, and considering the commitment from the science to the society, efforts should be invested: to continuously improve the model forecast particularly in coastal areas; to further progress in methodologies assessing forecasting skill; to provide near real-time reliable observations; to promote the use of new technologies and the development of new sensors; and to create customized services to enhance efficiency of SAR missions.

Supporting these efforts and directly aligned with the effective strategy for stimulating the user uptake of Copernicus Marine Service data and information, the IBISAR downstream service (www.ibisar.es) aims to provide real-time information of the ocean current forecast products available in the Iberian-Biscay-Irish (IBI) regional seas, and present their performance skill.

IBISAR skill assessment service, built on an existing operational service and generated using E.U. Copernicus Marine Service information, consists of an automated process to quantify performance of forecasting models in simple metrics with 3 steps: (i) simulates trajectories using the available forecast models overlapping in the IBI area; (ii) compares simulated against observed trajectories (derived from drifters, or computed from gap-filled surface currents derived from high-frequency radars); (iii) scores the models based on their performance. The model performance information provided, based on easily interpretable metrics is displayed in a user-friendly way, that can be used on an operational basis, which aids SAR operators and emergency responders in their decision making process.

The usability of the IBISAR service lies in its 3 main elements: (i) a regularly updated database of current forecasts and observations, including CMEMS ocean models and in-situ observation data (e.g. drifters trajectories) as well as regional and coastal high-resolution models from external sources and the high-frequency radar data; (ii) a graphical user interface, acting as a single access point for serving and visualizing all available data; and (iii) the skill assessment functionality, which computes the model assessment and displays the easily interpretable metrics of model accuracy.

The use of IBISAR would also benefit CMEMS by reinforcing their products visibility, assessing actual model-based products to compare with observation, and promoting the use of the forthcoming high-frequency radars data.