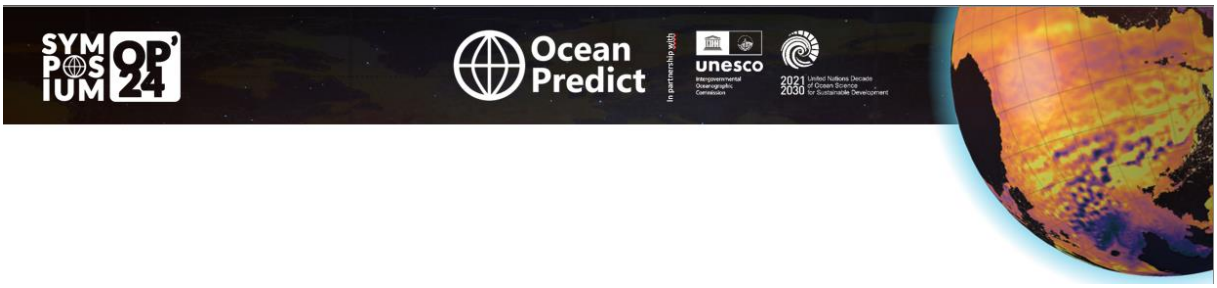

A high-resolution hydrodynamic forecasting system for the enhanced management of Fangar Bay (Ebro Delta, NW Mediterranean): the e3HOPE service

The Ebro Delta, a low-lying region heavily altered by human activity, faces significant climate change and resource exploitation risks, while remaining a highly relevant area from an environmental standpoint (Natural Park, EU Natura 2000 site and UNESCO Biosphere Reserve). As an example, its coastal bays (Fangar and Alfacs) are among the most productive aquaculture regions in the NW Mediterranean, yet they are also protected natural areas crucial for the survival of various species, including the critically endangered Pinna nobilis. To improve the management of this area, NOW Systems is leading the development of the e3HOPE Service, a high-resolution coastal operational forecast system that fills the gap existing between the current Copernicus Marine regional products and the local needs for higher-resolution coastal information, fulfilling requirements from local stakeholders, such as IRTA, and supporting sustainable aquaculture activities. This Service is based on a COAWST model application, nested into the Copernicus regional solution, and provides daily forecasts at a 350 m resolution for the whole Ebro Delta, and higher resolution (around 70 m) products for Fangar Bay. The combination of CMEMS and e3HOPE allows a seamless modelling, from regional to local scales, in the area. The e3HOPE coastal service is integrated into the NAUI web service, a bespoke visualization service layer specifically co-designed with IRTA for the Delta and Fangar Bay. NAUI is a highly customizable tool deployed by NOW that allows the visualization of meteorological and oceanographic field data together with the e3HOPE forecasts at selected locations. In this contribution, we focus on the implementation by LIM/UPC of the new COAWST wave-current coupled system and its pre-operational qualification, done by using one year of available in-situ data from a variety of sources, including systematic CTD profiling, local field campaigns, and automatic observational networks. Some insights into the operational forecast products delivered by the e3HOPE service will also be provided, together with a description of potential improvements to upgrade the capabilities and reliability of the model system. The new Ebro Delta NAUI system presented simplifies and enhances the use of (new and existing) operational forecasts, making coastal data more actionable and transferable into fit-for-purpose applications for management, supporting sustainable aquaculture activities and biodiversity conservation. Acknowledgements: This work has been funded by the contract 22050L03-COP-INNO USER-9000: Coastal marine (pre)operational services around the Mediterranean Sea.

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