

Evaluation of the impact of daily river runoff on ecological models and reanalysis products

The OPERR project has two overall objectives, according to the project description: "...first to turn a pan-European river discharge model into operational use and thereby acting as a downstream service based on earlier developed GMES core services and at the same time stimulating the development and improvement of new downstream services..." and secondly "the validation of observed river discharge and the river discharge estimates produced by the project in applications of shelf sea ocean."

This report addresses the second objective of OPERR. Specifically, it aims to assess the quality of the hindcast datasets produced in the project by SMHI, using the prognostic river discharge model E-HYPE. The report focuses on two different tasks. The objective of the first task is to assess the impact of assimilating river runoff data in a Biscay hydrodynamic model simulations, and thus assessing the utility of having river runoff forecast estimates, such as those from E-HYPE, for better predictions on coastal hydrological conditions, while in the second task the focus has been on an evaluation of the impact of using E-HYPE data in an ecological ocean model for the North Sea. The main focus of the present deliverable is to see the impact of different rivers (E-HYPE data or observations) on the quality of results when applied in numerical ocean models. The validation of the actual runoff through a comparison with observed river data is presented in D4.1 and is not considered here.

In simple terms, the aim of this work is to investigate the importance and sensitivity in ocean models to the river forcing, and how well an ocean model using E-HYPE is able to reproduce observed features in the ocean compared to the same model using observed river runoff. The main question to be answered is whether or not E-HYPE can replace the traditional river data used by most ocean modellers. The validation studies are carried out using the ROMS model for the Biscay and the NORWECOM ocean model for a hindcast covering an extended North Sea with a special focus on the quality of the model along the Torungen-Hirtshals transect in the Skagerrak.

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