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ENSURF: Multi-model sea level forecast. Implementation and validation results for the IBIROOS region

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ABSTRACT

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ENSURF is a multi-model application for sea level forecast that makes use of existing storm surge or circulation models today operational in Europe, as well as near-real time tide gauge data in the region, with the following main goals:
providing an easy access to existing forecasts, as well as to its performance and model validation, by means of an adequate visualization tool
generation of better forecasts of sea level, including confidence intervals, by means of the Bayesian Model Average Techique (BMA)
The system was developed and implemented within ECOOP (C.Nº 036355) European Project for the NOOS and the IBIROOS regions, based on MATROOS visualization tool developed by Deltares. Both systems are today operational at Deltares and Puertos del Estado respectively. The Bayesian Modelling Average technique generates an overall forecast probability density function (PDF) by making a weighted average of the individual forecasts PDF's; the weights represent the probability that a model will give the correct forecast PDF and are determined and updated operationally based on the performance of the models during a recent training period. This implies the technique needs the availability of sea level data from tide gauges in near-real time. Results of validation of the different models and BMA implementation for the main harbours will be presented for the IBIROOS region, where this kind of activity is performed for the first time. The work has proved to be useful to detect problems in some of the circulation models not previously well calibrated with sea level data, to identify the differences on baroclinic and barotropic models for sea level applications and the general improvement of the BMA forecasts.

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