



Ensemble prediction as a tool for probabilistic forecast of floods in Venice

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This study describes how an Ensemble Prediction System (EPS) for operational forecasting can be used for providing a probabilistic forecast of Sea Level (SL) and information on uncertainty of its prediction. The aim is to provide information for operating the movable barriers that are presently being built for preventing flooding of Venice during the high storm surge events, which frequently occur in the North Adriatic Sea. In this study ten relatively high storm surge events in the period 2009-2010 are simulated producing for each of them an ensemble of 50 simulations. Our analysis shows that the large storm surges correspond to maxima of uncertainty for SL (as described by the spread of the EPS members) and suggests that uncertainty increases approximately linearly with the forecast range. Such uncertainty on storm surge levels is mainly caused by that of the forcing meteorological fields (surface winds and sea level pressure), but the dynamics of the seiches of the Adriatic Sea introduces a periodic modulation of the uncertainty after each storm surge.