



Storm surge forecasting in Venice with a combination of hydrodynamic modelling and neural networks.

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Since the end of 2002 a finite element hydrodynamic model, called SHYFEM, is operational at the Office for the tidal forecast of the Venice municipality (ICPSM). It solves the 2D shallow water equations in a grid of the Mediterranean Sea, and is forced by the wind and pressure fields provided by the ECMWF Centre. Since December 2007 a post-processing routine of the sea level forecast based on a neural network is operational. For each forecast hour a different neural network composed by 51 input neurons 14 hidden neurons and 1 output neuron was set up. The 51 input data are composed by forecasts, observations and model errors. All these data are available at the moment of the model run. The output is the corrected storm surge forecast for that hour. The neural networks have been calibrated with the data of 2003, 2004, 2005 and tested with the data of 2006. An analysis of the results shows a strong increment of the precision of the model for all the forecast hours, specially for the first day. The next step will be an operational version of the model with four simulations per day in order to use new observed data as efficiently as possible.