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The wave-oceanographic model COAWST to forecast sea-level and waves for the Adriatic Sea and the Emilia-Romagna coasts.

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The coastal forecasting system of the Emilia-Romagna region managed by Arpae-SIMC is composed by a chain of meteorological, oceanographic, wave and coastal numerical models that are analyzed in order to provide the regional Civil Protection Department with weather and marine warnings. The critical variables to correctly forecast for coastal warnings are sea level and waves along the coasts.
AdriaROMS is the current operational model that forecasts sea level. It is an implementation of the Regional Ocean Modeling System (ROMS) for the Adriatic Sea, in the Mediterranean, which models sea level, salinity, temperature and currents. In order to update and optimize the operational model, the Coupled-Ocean-Atmosphere-Wave-Sediment Transport Modeling System (COAWST model) is used, which couples ROMS with the wave model Simulating WAves Nearshore (SWAN).
The new implementation is characterized by 1 km horizontal resolution and it is forced at the surface by the atmospheric fields of COSMO-I7 and at the southern boundaries by the currents, temperature and salinity fields of the Mediterranean Forecasting system (MFS). It takes into account of 49 rivers on the Adriatic basin and it is forced by 8 astronomical tidal components.
A study on a couple of storm events have been carried out by testing different model configurations and forcing, with the goal to find the optimal configuration for the model. The results from the different configurations are discussed and compared with data and with the operational Arpae oceanographic forecasting model AdriaROMS.