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Comparison between physical variables acquired by a new multiparametric platform, ELFO, and data calculated by a three-dimensional hydrodynamic model in different weather conditions at Tiber River mouth (Latium coast, Italy)

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The coastal ecosystem is characterized by high variability physical processes, which are strongly influenced by sudden changes in weather conditions. For this reason instruments able to collect data in a short time or mathematical models able to simulate the same phenomena from experimental data are basic.
In this study in situ data are compared with data calculated by three-dimensional hydrodynamic model.
The multiparametric platform was developed ad hoc by Laboratory of Experimental Oceanology and Marine Ecology (DECOS, Tuscia University) for coastal monitoring by small vessels (ELFO), and integrates temperature, conductivity, dissolved oxygen and suspended solids measures with bio-optical measures like fluorescence, photosynthetic efficiency and PAR.
The hydrodynamic model is the three-dimensional coastal hydrodynamic DELFT3D-FLOW simulating processes of temperature and salinity diffusion and the transport of suspended sediment (cohesive and non cohesive) in the water column.
This study analyses the area at mouth of Tiber river investigated by two surveys wiht different weather conditions. Data collected during the first survey were used to calibrate the DELFT3D-FLOW model which computational domain extends from the Argentario headland to Capo Anzio.
A microscale wind field (resolution of about 7 km), provided by the atmospheric model COSMO-ME (developed by CNMCA of Aeronautica Militare, Italy), was used to reproduce the hydrodynamic field and the distribution of the physical variables of the whole period.
In this way the data calculated by the model can be compared with those collected in situ during the second survey. Moreover dynamic phenomena existed between the two monitoring periods can be investigated.