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Mediterranean monitoring and forecasting operational system for Copernicus Marine Service

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The MEDiterranean Monitoring and Forecasting Center (Med-MFC) is part of the Copernicus Marine Environment Monitoring Service (CMEMS, http://marine.copernicus.eu/), provided on an operational mode by Mercator Ocean in agreement with the European Commission.
Specifically, Med MFC system provides regular and systematic information about the physical state of the ocean and marine ecosystems for the Mediterranean Sea. The Med-MFC service started in May 2015 from the pre-operational system developed during the MyOcean projects, consolidating the understanding of regional Mediterranean Sea dynamics, from currents to biogeochemistry to waves, interfacing with local data collection networks and guaranteeing an efficient link with other Centers in Copernicus network.
The Med-MFC products include analyses, 10 days forecasts and reanalysis, describing currents, temperature, salinity, sea level and pelagic biogeochemistry. Waves products will be available in MED-MFC version in 2017. The consortium, composed of INGV (Italy), HCMR (Greece) and OGS (Italy) and coordinated by the Euro-Mediterranean Centre on Climate Change (CMCC, Italy), performs advanced R&D activities and manages the service delivery.
The Med-MFC infrastructure consists of 3 Production Units (PU), for Physics, Biogechemistry and Waves, a unique Dissemination Unit (DU) and Archiving Unit (AU) and Backup Units (BU) for all principal components, guaranteeing a resilient configuration of the service and providing and efficient and robust solution for the maintenance of the service and delivery. The Med-MFC includes also an evolution plan, both in terms of research and operational activities, oriented to increase the spatial resolution of products, to start wave products dissemination, to increase temporal extent of the reanalysis products and improving ocean physical modeling for delivering new products.
The scientific activities carried out in 2015 concerned some improvements in the physical, biogeochemical and wave components of the system. Regarding the currents, new grid-point EOFs have been implemented in the Med-MFC assimilation system; the climatological CMAP precipitation was replaced by the ECMWF daily precipitation; reanalysis time-series have been increased by one year.
Regarding the biogeochemistry, the main scientific achievement is related to the implementation of the carbon system in the Med-MFC biogeochemistry model system already available. The new model is able to reproduce the principal spatial patterns of the carbonate system variables in the Mediterranean Sea. Further, a key result consists of the calibration of the new variables (DIC and alkalinity), which serves to the estimation of the accuracy of the new products to be released in the next version of the system (i.e. pH and pCO_2 at surface).
Regarding the waves, the system has been validated against in-situ and satellite observations. For example, a very good agreement between model output and in-situ observations has been obtained at offshore and/or well-exposed wave buoys in the Mediterranean Sea.