

The Copernicus Marine Service ocean forecasting system for the Mediterranean Sea

Authors:

G. Coppini⁽¹⁾, E. Clementi⁽¹⁾, G. Cossarini⁽²⁾, G. Korres⁽³⁾, M. Drudi⁽¹⁾, P. Agostini⁽¹⁾, G. Bolzon⁽²⁾, S. Creti⁽¹⁾, D. Denaxa⁽³⁾, R. Escudier⁽¹⁾, L. Feudale⁽²⁾, A.C.Goglio⁽¹⁾, A. Grandi⁽¹⁾, P. Lazzari⁽²⁾, R. Lecci⁽¹⁾, V. Lyubartsev⁽¹⁾, S. Masina⁽¹⁾, F. Palermo⁽¹⁾, N. Pinardi^(1,4), J. Pistoia⁽¹⁾, S. Salon⁽²⁾, M. Ravdas⁽³⁾, C. Solidoro⁽²⁾, A. Teruzzi⁽²⁾, A. Zacharioudaki⁽³⁾

(1) CMCC, Euro-Mediterranean Center on Climate Change, Italy

(2) OGS, National Institute of Oceanography and Applied Geophysics, Italy

(3) HCMR, Hellenic Centre for Marine Research, Greece

(4) Department of Physics and Astronomy, University of Bologna, Italy

Abstract

The Mediterranean Monitoring and Forecasting Center (MED-MFC) is part of the Copernicus Marine Environment Monitoring Service (CMEMS) and operationally produces Near Real Time (NRT) and Reanalysis products for the Mediterranean Sea dynamics, from currents (Med-PHY) to waves (Med-WAV) and biogeochemistry (Med-BIO).

The NRT products consist of numerical analysis and short term forecast (e.g. 10 days) of the main physical (temperature, salinity, currents, sea level), wave (integral parameters of the wave spectrum e.g. significant wave height, wave period, wave direction and the Stokes drift) and biogeochemical (chlorophyll-a, phytoplankton, oxygen, nitrate, phosphate, pH, carbon dioxide, dissolved inorganic carbon, primary production) ocean fields at a horizontal resolution of $1/24^\circ$ and 141 vertical levels.

The modelling systems are based on state of the art community models (NEMO, WAM and BFM), assimilate observational In-situ and satellite CMEMS data and are forced by ECMWF analysis and forecast atmospheric fields.

Improvements and functioning of the MED-MFC are based on the full consistency among the three components (i.e., resolution, domain and set up) which are jointly upgraded from the Med-PHY down to the other off-line coupled components (Med-BIO and Med-WAV) and include a continuous amelioration of the accuracy of the products (i.e., pre-operational qualification and NRT validation).

The focus of this work is to present the MED-MFC operational modelling systems and the available products, their skill assessment, main recent achievements and future upgrades.