



## Recent updates to the Copernicus Marine Service Black Sea Analysis and Forecasting System

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The operational near real time and reanalysis physical system for the Black Sea is one of the three production units of the Black Sea Monitoring and Forecasting Centre (BS-MFC). It is operationally working since October 2016 in the framework of Copernicus Marine Environment and Monitoring Service (CMEMS), producing every day 3-days analysis, 1-day hindcast and 10-days forecast for the main physical parameters (temperature, salinity, sea surface height, currents, mixed layer depth, bottom temperature). Once a week, the forecasting system is restarted from 14-days analysis to assimilate all available satellite and in-situ data. Products are operationally delivered through the CMEMS Dissemination Unit (DU).

The Black Sea Physics near real time (BS-PHY NRT) system is based on the state of the art NEMO community model, which solves the primitive equations on a horizontal grid at 1/36x1/27 resolution, forced by ECMWF (European Centre for Medium-range Weather Forecasts) atmospheric fields. The system is coupled with a 3DVAR data assimilation system which is able to assimilate in-situ temperature and salinity profiles, provided by CMEMS INS TAC, sea level anomaly satellite data provided by CMEMS SL TAC and sea surface temperature satellite data provided by CMEMS SST TAC (TAC is the Thematic Assembly Centre).

The contribution presents ongoing recent updates for BS-PHY NRT, showing major improvements in the modelling component, in particular the Bosphorus Strait as open boundary condition, the increased number of vertical levels, from 31 to 122, and the data assimilation developments with increased vertical resolution EOFs for the background vertical error covariance matrix. The scientific assessment of the updated version of the BS-PHY NRT system is illustrated using quasi-independent datasets and model diagnostics. The contribution will document also future developments that will impact next system releases up to 2020.