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Assessment of the hindcast, nowcast and forecast capabilities of the Mercator-Ocean high resolution ocean forecasting system in the Atlantic and Mediterranean basins.

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In the framework of the European project GMES/MyOcean, Mercator-Ocean has been designing a hierarchy of ocean analysis and forecasting systems based on numerical models of the ocean and data assimilation methods. Since April 2008, Mercator-Ocean runs an Atlantic and Mediterranean system between 20°S and 80°N. It is eddy resolving as its horizontal resolution is 1/12° and it has 50 levels on the vertical with a surface refinement. The ocean and sea ice models are based on the NEMO code. The data assimilation algorithm is a reduced order Kalman filter using 3D multivariate modal decomposition of the forecast error covariance. The system assimilates conjointly altimeter data, SST and in situ observations (temperature and salinity profiles, including ARGO data). The real time operation of this system produces each week realistic 3-dimensional oceanic conditions (temperature, salinity, currents,...) two weeks back in time (hindcast and nowcast) and a two weeks forecast, driven at the surface by atmospheric conditions from the European Center for Medium Range Weather Forecast (ECMWF). Moreover, the system is operated daily to produce 7 days ocean forecasts with daily updates of the ECMWF atmospheric forcing. After a brief description of the system, we will present recent validation results. The first one will consist of a comparison between a glider and Mercator-Ocean fields along a particular section in Mediterranean Sea. The second one will consist of a study of forecast validity showing the impact of daily updates of the atmospheric forcing.