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Metrics for the global ocean, under the GODAE and MERSEA framework : application with the Mercator Ocean global system

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Both GODAE (Global Ocean Data Assimilation Experiment) and MERSEA (Marine EnviRonment and Security for the European Area) projects are gathering ocean operational forecasting systems which goals are to demonstrate capacity in real time estimation and forecast of the ocean dynamics. For operational centers, the validation stands both to verify that systems are running correctly, and to assess the quality of the products. The first is technical; the second relies on scientific approach. The validation approach, based on five forecasting systems intercomparison has started with the MERSEA Strand 1 project (2003-2004). Validation diagnostics, based on four classes of metrics were defined in the North Atlantic Ocean and the Mediterranean Sea, and then used to perform the assessment. This approach has been kept for the assessment during the MERSEA Integrated Project (2004-2008), and extended at the global scale, in collaboration with GODAE members. During the first demonstration phase of the MERSEA IP project (October 2005-April 2006), these metrics have been implemented in Mercator, the French global operational forecasting system (the global component of MERSEA). A description of the diagnostics and examples from the Mercator validation are provided. Observations play a significant role in the validation. When assimilated, like satellite altimetry of temperature and salinity in-situ data, they allow to measure the inner performance of the assimilation schemes and model errors. While independent data, like sea level from tide gauges, or velocity from drifting buoys allow to infer both the accuracy and the performance of the systems. A particular attention is paid now on methodology to assess the system performance, which directly provides information on the forecasting skill. Note also that a series

of methodology for exchanging data, based on common formats and tools (NetCDF, OpenDAP servers) has been developed and is now agreed and shared among the GO-DAE community.