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Intercomparison of Operational Ocean Forecasting Systems in the framework of GODAE

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One of the main benefits of the GODAE 10-year activity is the implementation of ocean forecasting systems in several countries. In 2008, several systems are operated routinely, at global or basin scale. Among them, the BLUElink (Australia), HYCOM (USA), MOVE/MRI.COM (Japan), Mercator (France), FOAM (United Kingdom), TOPAZ (Norway) and C-NOOFS (Canada) systems offered to demonstrate their operational feasibility by performing an intercomparison exercise during a three months period (February to April 2008). The objectives were: a) to show that operational ocean forecasting systems are operated routinely in different countries, and that they can interact; b) to perform in a similar way a scientific validation aimed to assess the quality of the ocean estimates, the performance, and forecasting capabilities of each system; and c) to learn from this intercomparison exercise to increase inter-operability and collaboration in real time.
The intercomparison relies on the assessment strategy developed for the EU MERSEA project, where diagnostics over the global ocean have been revisited by the GODAE contributors. This approach, based on metrics, allow for each system: a) to verify if ocean estimates are consistent with the current general knowledge of the dynamics; and b) to evaluate the accuracy of delivered products, compared to space and in-situ observations. Using the same diagnostics also allows one to intercompare the results from each system consistently.
Water masses and general circulation description by the different systems are consistent with WOA05 Levitus climatology. The large scale dynamics (tropical, subtropical and subpolar gyres) are also correctly reproduced. At short scales, benefit of high resolution systems can be evidenced on the turbulent eddy field, in particular when compared to eddy kinetic energy deduced from satellite altimetry of drifter observations. Comparisons to high resolution SST products show some discrepancies on ocean surface representation, either due to model and forcing fields errors, or assimilation scheme efficiency. Comparisons to sea-ice satellite products also evidence discrepancies linked to model, forcing and assimilation strategies of each forecasting system.

Key words: Intercomparison, ocean analysis, operational oceanography, system assessment, metrics, validation

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