



An operational ensemble Kalman Filter global ocean forecasting system: OceanMAPSv4

The Australian Bureau of Meteorology implemented the first operational ocean forecast system based on an advanced implementation of an asynchronous ensemble Kalman Filter to assimilate real-time observations into an eddy resolving ocean general circulation model in June 2022. Specifically, a hybrid-EnKF method was introduced based on 48 dynamic members and 144 stationary low-mode members based on a daily analysis cycle. Ocean Model, Analysis and Prediction System version 4.1i delivers many significant improvements over the previous system including initial conditions with improved dynamical balance and forecasts with robust reductions in mean absolute difference against all reference observations including Jason-series altimetry, Argo profiles, in situ sea surface temperature and near-surface currents. We will present a selection of evidence to demonstrate the performance gains for both the system and a selection of application metrics including comparisons with wide-swath altimetry from the pathfinder SWOT mission. We will also touch on the capability of this system to deliver ensemble-based probabilistic, extended range forecasting and progress toward earth system coupled forecasting.

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