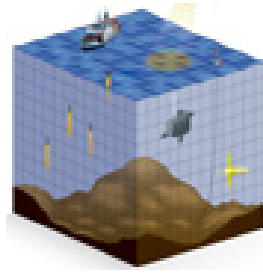


Joint ECMWF/OceanPredict workshop on Advances in Ocean Data Assimilation



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Assessing Impacts of Ensemble Kalman Filter (EnKF) on the Remo Ocean Data Assimilation System (RODAS) Over the South Western Atlantic

This work presents the implementation of the Ensemble Kalman Filter (EnKF) on the REMO Ocean Data Assimilation System (RODAS) with the Hybrid Coordinate Ocean Model (HYCOM) with $1/12^\circ$ on the western tropical and South Atlantic. The new version of RODAS employs a joint and multivariate assimilation of hydrographic profiles, UK MetOffice OSTIA Sea Surface Temperature (SST) and AVISO Absolute Dynamic Topography (ADT). Three experiments were performed for six months with assimilation cycle of ten days, (i) Control with no assimilation, (ii) A_EnOI employing Ensemble Optimal Interpolation (EnOI) and (iii) A_EnKF employing EnKF and forced with perturbed atmospheric fields. A_EnKF was successfully implemented as ensemble spread was maintained around 0.35°C , 0.03 m and 0.05 psu for temperature, Sea Surface Height (SSH) and salinity, respectively. Also, the mean Root Mean Squared Deviation (RMSD) of all ensemble was greater than the RMSD of the mean run for temperature and salinity. The mean correlation of SSH with respect to AVISO was 0.12, 0.33 and 0.31 and the RMSD of SST with respect to OSTIA was 0.92 , 0.52 and 0.47°C for Control, A_EnOI and A_EnKF, respectively. For the subsurface, RMSD with respect to ARGO was 0.22, 0.20 and 0.18 psu for salinity and 1.42 , 0.91 and 1.09°C for temperature for Control, A_EnOI and A_EnKF, respectively. Impacts on the Brazil Current are still been assessed. A_EnOI showed better SSH correlation and smaller temperature error while A_EnKF presented smaller error for SST and salinity. Therefore, A_EnKF shows comparable quality to RODAS previous version. For future works, it is expected with increase in ensemble members, from eleven to thirty three, the new version of RODAS should outperform its previous for SSH, SST and subsurface temperature and salinity.

Which theme does your abstract refer to?

Data assimilation methods (algorithmic developments in variational, ensemble and hybrid DA, covariance modelling, etc)

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