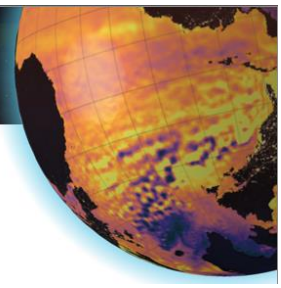

Preliminary results of SynObs Flagship OSEs–Assessments on impact of satellite altimetry versus Argo profiles–

The SynObs project, endorsed as part of the United Nations Decade of Ocean Science for Sustainable Development, aims to maximize the utility of diverse ocean observation platforms for predicting ocean behavior. Under the SynObs project, a series of coordinated Observing System Experiments (OSEs) and Observing System Simulation Experiments (OSSEs) are performed using multiple operational ocean forecasting systems to evaluate the impact of different types of ocean observations. Specifically, more than nine types of OSEs will be conducted using multiple systems to evaluate impacts of specific observation platforms on ocean predictions. In this presentation, we will introduce preliminary results from three types of OSEs conducted under the SynObs Flagship OSEs framework based on four systems with varying model resolutions and data assimilation schemes. Here, we assess results of three types of OSEs a reference assimilation experiment (CNTL), an experiment excluding the satellite altimetry data (NoAlt), and an experiment excluding temperature and salinity profiles from Argo floats (NoArgo). First, a comparison of sea level anomaly (SLA) fields across each OSE revealed that SLA fields in the CNTL shows better agreement with observations compared to those in the NoAlt. However, the degree of improvement aided by the assimilation of the satellite altimetry data varies with systems; generally, systems with eddy-resolving ocean models (approximately 10km horizontal resolution) show more significant improvement by assimilating the altimetry data. Such feature is especially prominent in mid-latitude western boundary current regions, suggesting that higher resolution ocean models are necessary to fully leverage the potential of satellite altimetry data. We also assessed temperature and salinity (T/S) fields derived from each OSE using independent Argo profiles, and it turned out that CNTL exhibited the best agreement with observations. However, the relative importance of the satellite altimetry data and T/S profiles from Argo profile data in improving estimations of T/S vary across different systems. This indicates a need for further validation using a broader range of systems in future studies.

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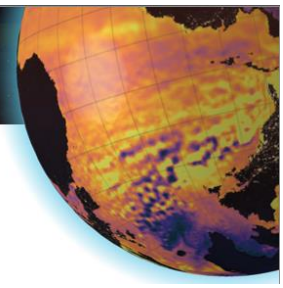

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