UN Ocean Decade Project SynObs and its potential Collaboration with IV-TT

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Abstract

"Synergistic Observing Network for Ocean Prediction (SynObs)" is a project of the United Nations Decade of Ocean Science for Sustainable Development. SynObs aims to demonstrate impacts of the ocean observing network on ocean and coupled ocean-atmosphere predictions and to contribute to the Ocean Observing Co-design activity. SynObs is conducting internationally coordinated multi-system observing system experiments (OSEs), SynObs flagship OSEs. In this activity, several ocean/climate prediction centers perform ocean observation sensitivity experiments, or OSEs, using their own prediction systems according to the pre-defined guideline of experimental settings. So far, we confirmed that the assimilating observations form either platform is effective to reduce uncertainty in the analysis SSH fields through investigation of the multi-system ensemble spread. In contrast, while the assimilation of Argo data consistently reduces the multi-system ensemble spread of the Tropical Cyclone Heat Potential (TCHP), the assimilation of satellite altimetry data increases the spread due to differences in the altimetry assimilation methods among the assimilation systems.

How to evaluate accuracy and uncertainty of analysis and prediction fields are important issues for identifying the impacts of ocean observations using multi-system simulations. Therefore, the Intercomparison and Validation Task Team (IV-TT), the Marine Environment Reanalysis Evaluation Project (MER-EP), and SynObs will discuss potential collaboration to explore scientifically robust and efficient evaluation methods at the SynObs and Ocean Observing Co-design International Workshop 2026 which will be held in Mutsu, Japan, on August 24-29. This includes a discussion on common diagnostics and tools to apply to SynObs OSEs and MER-EP reanalysis such as ocean indicators to highlight their sensitivity to assimilated observations. It is desirable to enhance the collaboration between IV-TT/MER-EP and SynObs based on the discussions at the workshop, and to accelerate fair and consistent evaluation of ocean observing systems through SynObs activities.