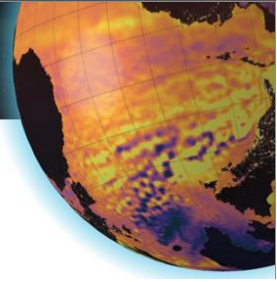


Impact of Observations on ECCC's Global Ocean Analysis, GLOPS

The Synergistic Observing Network for Ocean Prediction (SynObs) project (<https://oceanpredict.org/synobs>) seeks to find synergies between ocean observations and ocean prediction through a multi-system approach to an Observing System Experiment (OSE). Best estimates and predictions of ocean sound speed profiles, location of eddies, ocean currents, sea surface temperature and ocean water masses are important ocean diagnostics for a variety of ocean and/or coupled NWP applications. Skillful estimates of these diagnostics is presumably determined by the quantity and quality of ocean observations used in the ocean state estimation, but the exact value of the observations, and in particular, which observations are most crucial is unknown. Through OSE experiments performed by Environment and Climate Change Canada's system the Global Ice Ocean Prediction System (GIOPS) for the SynObs project, we will investigate the effect of observation withholding experiments on several of these diagnostics. Particular attention will be spent on experiments withholding ARGO observations (S1.12, S1.13), but other experiments withholding sea surface temperature and sea level anomaly altimeter observations (S3.1, S3.7, S3.12) will also be investigated for changes in the skill of accurately predicting the diagnostic. Short (10 day) coupled forecasts are currently in preparation to assess the effects on NWP applications (S1.12). Additional work showing the value of adding (synthetic) surface water and ocean topography (SWOT) observations will also be presented (S2.10). The Synergistic Observing Network for Ocean Prediction (SynObs) project ([\url{https://oceanpredict.org/synobs}](https://oceanpredict.org/synobs)) seeks to find synergies between ocean observations and ocean prediction through a multi-system approach to an Observing System Experiment (OSE). Environment and Climate Change Canada is participating in the SynObs project and has completed the 10 data withholding OSE analysis for 2020-2022. We will relate some of early results from the ECCC Global Ice Ocean Prediction System (GIOPS) analyzing fits to insitu data, performance in eddy tracking verification, current verification against drifting buoys and the system's ability to detect shallow water sound ducts. SynObs is a multi-system experiment: Time permitting, we hope to have some early multi-system results on some of the above novel analysis techniques discussed above.

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