Reducing initialization shock in coupled model by using coupled data assimilation

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In a coupled model, initialization shock is caused by an insistency between each component, which reduces forecasting skills. The coupled data assimilation (CDA) is considered to reduce the imbalance and be expected to improve forecasting skills. In this study, new CDA method based on incremental analysis update (IAU) is developed for Global seasonal forecasting system version 5 (GloSea5) used in Korea Meteorological Administration (KMA).

This method adjusts an atmosphere-ocean background of GloSea5 to atmosphere and ocean analysis field, simultaneously. The initial states from the CDA show a better consistency between surface temperature in the atmosphere model and sea surface temperature (SST) in the ocean model. Also using initial states from the CDA provided evidence to improve forecasting skills.

In this study, further analysis is conducted to investigate the balance between atmosphere and ocean initial states in an aspect of surface flux on the interface and examine much longer analysis period. Further, the forecasting skills in short-range to El Nino-Southern Oscillation (ENSO) prediction is also examined.

Key words: Data Assimilation, Coupled Model, Initialization, Prediction

※ This study was supported by the Korea Meteorological Administration Research and Development Program under Grant KMI2018-03110.