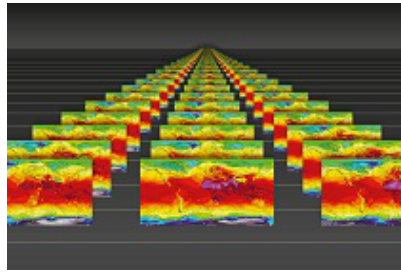


Workshop on Predictability, dynamics and applications research using the TIGGE and S2S ensembles



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Using the S2S Database to Evaluate the Performance of the Navy Earth System Prediction Capability (ESPC) Ensemble

Wednesday, 3 April 2019 11:30 (15 minutes)

The Navy Earth System Prediction Capability (ESPC) is a coupled global model consisting of the Navy Global Environmental Model (NAVEM) atmospheric model coupled to the Global Ocean Forecast System (GOFS), which consists of the Hybrid Coordinate Ocean Model (HYCOM) and the Los Alamos Community Ice Code (CICE). The performance of a 15-member Navy ESPC ensemble during 2017 is compared to coupled ensemble systems from the Subseasonal-to-Seasonal (S2S) database. S2S database forecasts served as a valuable benchmark as the Navy ESPC was being evaluated prior to its transition into operations.

Comparisons between the Navy ESPC and archived S2S ensembles focus on the relationship between key tropical modes of variability such as the Madden-Julian Oscillation (MJO) and El Niño Southern Oscillation (ENSO) and weekly-averaged conditions in the atmosphere from the tropics to the arctic. The MJO in the Navy ESPC is shown to be too intense and fast; in contrast most models have an MJO which is too weak and slow. Process-based diagnostics shown to have a strong relationship with MJO behavior, such as the relationship between rain rate and outgoing longwave radiation and mean biases in mid-level humidity, are used to explain differences in MJO behavior in the Navy ESPC and S2S models. Composites of MJO behavior in each of the models and their global teleconnections are used to explain differences in the predictive skill of the models. Metrics used to evaluate the Navy ESPC and S2S ensembles include measures of predictive skill, mean biases, and ensemble performance.

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