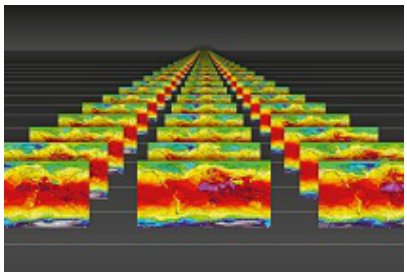

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Multi-model Prediction on Subseasonal Timescales at the US NOAA Climate Prediction Center: Approaches to Calibration and the Identification of Forecasts of Opportunity

Thursday, 4 April 2019 09:30 (30 minutes)

Forecasting temperature and precipitation on subseasonal timescales beyond two weeks lead-time is at the limits of predictability and modeling capabilities. The NOAA Climate Prediction Center (CPC) relies on both dynamical and statistical models to make operational and experimental, above and below median, temperature and precipitation forecasts for weeks 3 and 4. Both statistical and dynamical forecast models attempt to utilize the enhanced predictability during active climate events, related to modes of climate variability, such as ENSO and the Madden-Julian Oscillation. Other than the predictability due to decadal climate change, much of the skill of subseasonal forecasts is related to these drivers of climate variability. Furthermore, much of the utility of subseasonal forecasts lies in the forecast of extremes in temperature and precipitation, which by their nature are intermittent and often associated with high amplitude climate drivers. Ensemble models allow for the generation of probabilistic forecasts, while calibration assures reliability of forecast probabilities and correction of model biases. Various methods of calibration and combination to create multi-model ensemble (MME) forecasts have been considered. While a calibrated multi-model ensemble (MME) of dynamical model forecasts has proven to be one of the most skilful tools in CPC operational, subseasonal forecasts, skill remains low for precipitation forecasts and at times, near zero for all forecasts. Therefore, identification of forecasts of opportunity, when predictability is enhanced, could greatly improve the utility of forecasts on this timescale. To analyse the potential to identify forecasts of opportunity, we examine the skill of subseasonal forecasts (including extremes relative to the past climatological distribution) when the signal magnitude is greater, using hindcasts from the S2S and SubX databases. In this way, we examine if intermittent forecasts of larger magnitude signals represent the best opportunity to obtain information for extended-lead subseasonal forecasts (weeks 3-4), including extremes, and determine appropriate metrics of forecasts of opportunity. A multi-model ensemble significantly improves the capacity to identify forecasts of opportunity over individual models.

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