SESSION: (A3) S2S ensemble predictions and forecast information

(A3-06)

Identifying the capacity of dynamical models to forecast subseasonal extremes: Multi-model ensembles

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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 3-4. 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 timescale changes in climate, 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 likely associated with high amplitude climate drivers. While a calibrated multi-model ensemble (MME) of dynamical model forecasts has proven to be one of the most skillful 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 analyze the potential to identify forecasts of opportunity, we examine the skill of forecasts of extremes (identified as the 15th and 85th percentiles from the past climatological distributions) when they are predicted, using hindcasts from the SubX MME. 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. It has been found that a multi-model ensemble significantly improves the capacity to identify forecasts of opportunity for extremes.