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## Uncertainties in Extended-Range Precipitation Forecasts: Model Biases or Predictability Limits

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In this study, we analyze the reason for low prediction skill in extended-range precipitation forecasts over the US west coast during boreal winter from the NCEP Climate Forecast System version 2 (CFSv2). Our assessment focuses on whether low skill is due to the biases in CFSv2 or is consistent with the possibility of low inherent predictability over that region. The analysis is based on large dataset of ensemble forecasts from CFSv2 and other six dynamical models. The results strongly indicate that low prediction skill for the precipitation over the US west coast is not because of model biases, but may be due to low underlying signal-to-noise ratio (SNR), i.e., the low inherent predictability. Consistent with low SNR, there are large inconsistencies in the precipitation ENSO responses across different El Niños and across different models. The linkage of the low prediction skill over the US west coast and its possible dynamical reasons are also studied.

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