Prediction of the Arctic Oscillation in Boreal Winter by Current Operational Ensemble Seasonal Prediction Systems

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This study assesses the prediction skill of the boreal winter Arctic Oscillation (AO) in the state-of-the-art dynamical ensemble prediction systems (EPSs): the UKMO GloSea4, the NCEP CFSv2, and the NASA GEOS-5. Long-term reforecasts made with the EPSs are used to evaluate representations of the AO, and to examine skill scores for the deterministic and probabilistic forecast of the AO index. The reforecasts reproduce the observed changes in the large-scale patterns of the Northern Hemispheric surface temperature, upper-level wind, and precipitation according to the AO phase. Results demonstrate that all EPSs have better prediction skill than the persistence prediction for lead times up to 3-month, suggesting a great potential for skillful prediction of the AO and the associated climate anomalies in seasonal time scale. It is also found that the deterministic and probabilistic forecast skill of the AO in the recent period (1997-2010) is higher than that in the earlier period (1983-1996).