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Calibrating Forecasts of Surface Air Temperature over South Korea using Bayesian Model Averaging

Chansoo Kim (1), Seok-Geun Oh (2), and Myoung-Seok Suh (2)

(1) Kongju national university, Dept. of Applied Mathematics, Gongju, Korea, Republic Of (chanskim@kongju.ac.kr), (2) Kongju national university, Dept. of Atmospheric science, Gongju, Korea, Republic Of (sms416@kongju.ac.kr)

In this study, we investigate the prospect of calibrating of probabilistic numerical forecasts of surface air temperature over South Korea by using Bayesian model averaging (BMA). The simulation results from four regional climate model (RCM) with two boundary conditions (NCEP-DOE and ERA-interim) over the CORDEX East Asia are obtained. The one month weighted ensemble outputs for the 59 stations over South Korea are calibrated using BMA method for 48 monthly time periods base on BMA weights obtained from the previous 15 months of training data. The predictive density function is calibrated using BMA and the individual forecasts are weighted according to their performance. The calibrated probabilistic forecasts are assessed using flatness of the rank histogram and residual quantile-qunatile (R-Q-Q) plot. They show that the simulation skills of the RCMs differ according to season and geographic location, but the RCMs show a systematic cold bias irrespective of season and geographic location. The results show that the application of BMA improves the calibration of the raw ensemble and other weighted ensemble mean forecasts irrespective of simulation skill of the RCM and geographic location. In addition, the deterministic-style BMA forecasts usually perform better than the deterministic forecast of the single best member.