

Probabilistic Forecast of Extreme High Temperature in Extended Period with the Bayesian Model Averaging

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The method of the Bayesian model averaging (BMA) is employed to improve extended probabilistic forecast of extreme high temperature based on the ensemble prediction system (EPS) outputs of ECMWF, NCEP, and UKMO from the sub-seasonal to seasonal (S2S) prediction project database in this study. The outcomes of BMA, single-model EPS and multi-model EPSs are verified with mean absolute error (MAE), correlation coefficient (ACC), brier score (BS), and continuous ranked probability score (CRPS). On the basis of comparison between the verifications, it is suggested that the BMA performs better than single-model EPS and multi-model EPS in all leading times for all verification method. Although the BMA has improved the raw probabilistic forecast substantially, the lead time can only reach up to 9 days in terms of positive skill of BMA Bier skill score for extreme high temperature ($\geq 35^{\circ}\text{C}$). To extend valid lead time, the raw outputs of single-model EPS are preprocessed with the running mean method for training before BMA. It turns out that the running-mean BMA is able to extend the lead time of positive skill to 11 days.

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