



Calibration of probabilistic precipitation forecasts from the RSM ensemble system by an artificial neural network

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An artificial neural network (ANN) is used to calibrate probabilistic quantitative precipitation forecasts (PQPF's) from a 12-km version of NCEP's RSM Ensemble Forecast System. 24-hour precipitation accumulations are calibrated for 2002-2003 cool season over the Southwest U.S. Multiple datasets are used for verification, with Stage IV estimates used to calibrate the ANN. Results are stratified by river basin.

Calibration yields Brier scores that are significantly more skillful than the uncorrected forecasts for amounts up to 50 mm. Decomposition of the Brier score indicates that the improvement primarily comes from the mitigation of conditional biases. Calibration generally does not significantly alter the ability to discriminate events, but for rarely observed events discrimination can decrease.

The results indicate that ANN calibration can mitigate biases in ensemble PQPF fields after a short training period of 90 days. It appears that major improvements in forecast specificity, especially for heavy amounts, may have to await multivariate screening of dynamic-thermodynamic predictors from a larger training sample and more accurate model fields from improved ensemble forecast systems.