



Demonstration of the MODE object-based verification tool for the evaluation of model precipitation fields

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Application of an object-based verification tool, the Method for Object-based Diagnostic Evaluation (MODE), is demonstrated using precipitation forecasts from three versions of the Weather Research and Forecast (WRF) model. The MODE tool is included in the first version of the Model Evaluation Tools (MET), which is a suite of verification tools being developed for the WRF community. Methods for comparing the performance of the three model versions are presented, as well as methods for evaluating performance as a function of scale. Because results obtained from the application of spatial verification methods vary significantly as a function of the spatial scale of the forecast and observation fields, the latter evaluation is a critical aspect of the evaluation of high resolution forecasts. In the case of MODE, the scale can be represented by the two parameters used to define objects: the convolution radius and the threshold. In addition, examples are presented that demonstrate a diagnostic evaluation of precipitation forecasts based on the output of MODE at a single scale. This evaluation includes consideration of distributions of performance attributes such as location, timing, intensity, shape, and orientation errors.