



A simple method to improve ensemble-based ozone forecasts

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Forecasts from seven air quality models and ozone data collected over the eastern USA and southern Canada during July and August 2004 are used in creating a simple method to improve ensemble-based forecasts of maximum daily 1-hr and 8-hr averaged ozone concentrations. The method minimizes least-square error of ensemble forecasts by assigning weights for its members. The real-time ozone forecasts from this ensemble of models are statistically evaluated against the ozone observations collected for the AIRNow database comprising more than 350 stations. Application of this method is shown to significantly improve overall statistics (e.g., bias, root mean square error, and index of agreement) of the weighted ensemble compared to the averaged ensemble or any individual ensemble member. If a sufficient number of observations is available, we recommend that weights be calculated daily; if not, a longer training phase will still provide a positive benefit. Our study shows that the magnitudes of weights do not necessarily correspond to the quality of each ensemble member. In the current set-up a three-member ensemble performs equally as well as an ensemble with a higher number of members.