

The Strength of Ensembles Lies not in Probability Forecasting

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Abstract

How can one best use an ensemble forecast system in making decisions in the real world that are influenced by the future weather? Several actual applications will be considered, and some real-time forecasting will be required (interactively) from the audience. It will be argued that it is costly to act as if ensembles gave us useful probabilities (in any of the Bayesian senses), but that ensemble can and do yield probabilistic information and can and has been used to advantage in weather sensitive decision making. Ensembles can provide early warning that our model is sensitive to the state of the atmosphere today, but that is a somewhat different from any claim regarding the predictability of the atmosphere itself today. The search for accountable ensembles (Smith, 1995) is, I now believe, wrong-headed, given that our dynamical models are imperfect. Rather than assuming calibration where it rarely exists, one can work with practitioners to identify useful questions which can be informed in a robust and useful manner. The Forecast Direction Error approach illustrates one successful application in the electricity sector (Smith, 2016). Our approach can never be as attractive as what one could achieve given “true” (or accountable) probability forecasts, but then we are not competing against such “fantastic objects.” Implications for other uses of ECMWF forecasts, and for model development, are touched on.

Smith, L.A. (1995) '[Accountability and error in ensemble forecasting](#)', In 1995 ECMWF Seminar on Predictability. Vol. 1, 351-368. ECMWF, Reading.

Smith, L.A. (2016) '[Integrating information, misinformation and desire: improved weather-risk management for the energy sector](#)', in Aston, P et al. (ed.) *UK Success Stories in Industrial Mathematics*, 289-296. Springer