Beyond Bayesian Updating

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Abstract

Ensemble weather forecasts launch an ensemble of around 50 simulations about every 6 hours, each simulation extending at least a week from its launch time. Once a new ensemble is available, information from previous forecasts is often discarded. While we usually expect the most recently launched ensemble to contain the most information, this needn't render previous forecast information irrelevant. We investigate ways of combining information from the most recently launched ensemble with previous probabilistic forecasts. We show that Bayesian updating using the previous forecast as a prior and updating with the new ensemble forecast yields an improvement in forecast skill over those based on individual ensembles when the model is perfect. When the model is imperfect, whilst the Bayesian approach can result in forecasts less skilful than those based only on the new ensemble, extending the blending approach proposed in Broecker and Smith (2008) can still yield some improvement.

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