

04 Bayesian Model Averaging (BMA)

Contents

- [Introduction](#)
- [Approach within FEWS](#)
- [BMA in FEWS](#)

Introduction

The Bayesian Model Averaging (BMA) is standard statistical approach for post-processing ensemble forecasts from multiple competing models. Bayesian Model Averaging (BMA) is a standard statistical approach for post-processing ensemble forecasts from multiple competing models (Laemer, 1978). The method has been widely used in social and health sciences and was first applied to dynamic weather forecasting models by Raftery et al (2005). Details of the method can be found therein.

The basic principle of the BMA method is to generate an overall forecast probability distribution function (PDF) by taking a weighted average of the individual model forecast PDFs. The weights represent the model performance, or more specifically, the probability that a model will produce the correct forecast. In a dynamic model application, the weights are continuously updated by investigating the model performance over the most recent training period. The variance of the overall forecast PDF is the result of two components. The first component is associated with the spread between the model forecasts. The second component is the uncertainty of each individual model forecast. The magnitude of this latter component is also determined over the training period.

See also published paper on [USE OF BAYESIAN MODEL AVERAGING TO DETERMINE UNCERTAINTIES IN RIVER DISCHARGE AND WATER LEVEL FORECASTS](#)

Approach within FEWS

The BMA module can be incorporated as FEWS Adapter Module

The page [BMA in FEWS](#) gives a basic schematic view on how the data transfer from FEWS to BMA module and viceversa should be like.