

Interactive comment on “Bayesian Network Model for Flood Forecasting Based on Atmospheric Ensemble Forecasts” by Leila Goodarzi et al.

Anonymous Referee #1

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The manuscript explores the use of Bayesian Network for flood forecasting using ensemble weather forecasts as input. The performance of the BN is compared against Artificial neural network – ANN and the authors conclude that BN outperform ANN. While exploring new methodologies and approaches for improving flood forecasting is always welcome, I have doubts about the reliability of those approaches compared to traditional methodologies, specifically the use of post-processing ensemble weather forecast as input of a distributed or lumped hydrological model. Usually, hydrological models are calibrated and validated for a long enough time-period, which ensure that they capture a wide range of hydrological conditions, including episodic floods. In this case, on the other hand, they were used 14 flood events to train and verified a BN and an ANN. Considering the large number of parameters those approaches include,

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a good performance and accuracy is expected. Under such circumstances, however, the risk of generating overparameterized models is significant. Although I recognize that flood events are statistically rare, it is important to demonstrate that the BN is able to capture a larger number of floods events. Perhaps a suggestion to overcome such limitations is to analyze a longer period of time to incorporate a larger number of flood events, and using observed rainfall instead of ensemble weather forecast (which are difficult to implement) to test whether the BN performs adequately. Finally, I don't know why the forecasting were limited to 24 h. It is well known that atmospheric models have acceptable skill scores for up to 4-5 days. Increasing the lead time will provide an opportunity for testing the use of BN for a larger number of cases.

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