Hydrology and Earth System Sciences Discussions

Interactive comment on "A Bayesian joint probability post-processor for reducing errors and quantifying uncertainty in monthly streamflow predictions" *by* P. Pokhrel et al.

Anonymous Referee #1

Received and published: 7 December 2012

Summary

The manuscript investigates the post-processing of monthly streamflow simulations generated by an hydrological model (WAPABA). A Bayesian joint probability modeling approach is used for the post-processing, and applied to 18 catchments in eastern Australia. This work builds on recent works of the authors (the post-processing technique and hydrological model). The overall motivation of the work is scientifically sound; the manuscript is well organized and written. This is a good example of integrating different modeling components for a direct application. Therefore I recommend the manuscript

to be accepted after some minor comments (see below) have been addressed by the authors.

Comments:

1) Prediction vs. simulations

The authors use the word prediction throughout the text, including the title and abstract. My first impression after reading the title and abstract was that the methods were applied to streamflow predictions/forecasts, i.e with a certain lead time. In my opinion, the word prediction is associated with something made "in advance". The authors use "simulation" to refer to the raw model output and prediction to the post-processed streamflow, however the post-processing is not adding "lead time" to the streamflow simulations, and this can be misleading. Therefore I would suggest changing "predictions" to "simulations", including in the title and abstract.

2) Methods description

The generation of streamflow simulation (section 3.1) and statistical post-processing (section 3.2) are much resumed, building on some recent work developed by the authors. To understand the model and statistical post-processing we need to read the previous papers. For example, I only understood the meaning of the parameter vector (theta) in eq. 1. after reading Wang et al (2009). I do not have access to the journal describing the hydrological model (Wang et al 2011), and it is very unclear how the calibration was performed, or the exact meaning of "scalarized multi-objective measure" (line 12, 11204). Without understanding this, a question comes to my mind: how sensitive is the post-processing to the calibration? I suggest that the authors include a more detailed description of the hydrological model, especially the calibration, and also of the post-processing. This could be included as appendix, but it is not mandatory, and I leave that decision to the authors and editor consideration.

3) Result of method C : including WAPABA lagged simulations

The negligible impact of including the WAPABA lagged simulations in the post-processing is interesting. Could this be related to the model design? small size of the catchments ? monthly time-scale ? It would be interesting to see this point further discussed.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 9, 11199, 2012.