Hydrol. Earth Syst. Sci. Discuss., 12, C3293–C3295, 2015
www.hydrol-earth-syst-sci-discuss.net/12/C3293/2015/

Hydrology and Earth System Sciences
Open Access
Discussions

Interactive comment on "Sub-daily runoff simulations with parameters inferred at the daily time scale" *by* J. E. Reynolds et al.

Anonymous Referee #3

Received and published: 25 August 2015

Review of "Subdaily runoff simulations with parameters inferred at the daily scale" by Reynolds et al.

The manuscript is concerned with the topic of exploring the dependence of model parameters and simulations on the time scale of the data. The paper is generally well written and easy to read.

I have the following comments:

1. The topic of time scale dependence has received quite a bit of attention in the literature. The manuscript cites most of these papers, but it is not clear in what way the findings of this study enhance existing knowledge. For example, the impact of numerical time stepping artefacts has now been shown quite comprehensibly. Is the

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

paper intended as an additional demonstration of this - which is useful in the sense of a case study for a specific location - or does it intend to go beyond - and if so in what way?

Some of the stronger conclusions are assumed to hold under general conditions despite the case study being an empirical one based on a single model single catchment. For example, while I agree that the use of robust time stepping schemes goes a long way towards alleviating many of the time scale dependencies, surely once you start averaging out the fine-scale features of high-resolution data, there has to be an impact on the identifiabilite/values of parameters, etc. Where would the information about these processes come from? What about fast responding catchments? I think more care should be taken when distinguishing between estimating average vs instantaneous (peak) flows, etc - as these may behave very differently.

I think a lot of the nuances expressed in previous studies have been overlooked in this presentation, especially in the conclusions as listed in points 2-4.

2. Some questions reguarding the technical aspect of the computations. For ekzample, See Fig 7 - I do not understand why the width of the prediction limits decreases, to the extent that the simulations in panel d completely fail to capture the observed data. Something must have gone wrong in the uncertainty analysis, as predictive uncertainty appears grossly under-estimated. The lack of diagnostics of predictive uncertainty is a fairly major omission. Looking at the hydrographs, maybe the Authrs forgot to account for residual error uncertainty in the predictions. I would recommend the authors use some basic least squares statistical analysis packages and they would obtain much better uncertainty estimates (probably at a fraction of the current computing cost).

3. In terms of nomenclature/terminology - it would be clearer to avoid the acronym EXP in reference to "experiment" in a study that talks a lot about the Explicit Euler scheme. I found this a bit confusing/distracting when going throu the presentation.

If these issues above could be convincingly clarified, the contributions and validity of

HESSD

12, C3293–C3295, 2015

the study would be more apparent.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 7437, 2015.