Hydrology and Earth System Sciences Discussions

Interactive comment on "Simulating stream flow over data sparse areas – an application of internet based data" *by* M. T. Vu et al.

Anonymous Referee #2

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The paper addresses an important problem in hydrology concerning runoff prediction in data sparse areas. The paper demonstrates the use of different internet-based data sources for setup and simulation with the SWAT model. I find the paper to be of interest for hydrological modellers; however, the paper is rather short in the presentation and discussion of the results.

The following issues should be addressed:

1. In the paper the APHRODITE rainfall product is chosen. Other rainfall products are available, and the choice of the APHRODITE product is not justified. Add a discussion on the choice of rainfall product, e.g. by summarising the results from Vu et al. (2011) (referred to in the paper) and other studies.

2. Local discharge data are used for calibration of the SWAT model. However, if this should have been a "true" demonstration of internet-based modelling, no local data should have been applied for the model calibration. It would be valuable to compare with such an approach, e.g. by using a non-calibrated SWAT model where model parameters are estimated from available physical parameters (e.g. land use, soil type, topography), or, if possible, by using satellite-based altimetry data for estimation of discharge.

3. The precipitation and temperature data are interpolated to station data. This approach seems inconsistent, since the raw precipitation and temperature data are gridded data, and the applied model is a distributed model. Why is this done? Seems to be a SWAT feature, but needs then to be justified.

4. The parameterisation of the model is not explained. How is the distribution of model parameters between sub-catchments and HRUs described? Ten parameters are selected for calibration, but are they assumed constant for the entire catchment?

5. The evaluation and discussion of model performance should be elaborated. The results show that the model consequently underestimates low flow and underestimates the larger peak flows. Other performance measures should be included in the assessment to provide a broader evaluation of model performance.

6. It is assumed that the land cover provided by the Global Land Cover product is representative for the conditions in the calibration and validation periods. Is this a reasonable assumption? And is this a critical assumption considering the calibration approach applied?

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