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Discussions

Interactive comment on "Integrated water system simulation by considering hydrological and biogeochemical processes: model development, parameter sensitivity and autocalibration" *by* Y. Y. Zhang et al.

Anonymous Referee #3

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The hydrological cycle and surface water quality are closely related to vegetation, soil and biogeochemical elements, which are strongly influenced by human activities. It is essential to quantify interactions among these components for watershed management. This research developed a comprehensive model, which is in great need to provide a tool for better understanding of system function.

One of my concern is the optimisation of the model structure, as sub-models were developed separately for different proposes. For example the biogeochemical module

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and crop growth module are site-specific, which may need detailed soil input. It is quite difficult to obtain in current soil datasets.

It may be helpful to show how to conduct model calibration and validation. The model is very comprehensive, and there 182 parameters in the model. It may have difficulty in determination of parameter values in practice. I hope the authors can add one paragraph in the discussion and show how the model is used in practice, and your perspectives in the model's optimisation and application.

In supplement 2.1, the 'accumulated heat' is actually effective temperature, i.e., average temperature minus a base temperature. The 'heat unit index' is actually the thermal time, which may be more understandable. I cannot see HUI ranges from 0 to 1 from S7, as PHUj may not equal to the accumulated HU over growing seasons.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 4997, 2015.