

Interactive comment on “VIC-CropSyst: A regional-scale modeling platform to simulate the nexus of climate, hydrology, cropping systems, and human decisions” by Keyvan Malek et al.

Anonymous Referee #1

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Review of the paper

“VIC-CropSyst: A regional-scale modeling platform to simulate the nexus of climate, hydrology, cropping systems, and human decisions” by Malek et al.

In this paper the authors describe a simulation platform that captures the nexus of land, atmosphere, and human processes in one model. To this end, they have coupled the macroscale Variable Infiltration Capacity (VIC) hydrologic model and the CropSyst agricultural model.

The paper is well written, good to understand and the results are well described. The topic of the study is of interest for scientists and natural resources decision makers.

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However, there are some shortcomings, and the major in my view is that they ignore the huge amount of literature and work which already has been done in this direction. The authors present the topic of the study, to fully couple hydrological and agricultural models in one system considering feedbacks, as if this is an entirely new field. Cited are only global scale studies with comparable approaches but not so far developed. But the case studies given in this paper are at the regional and even local scale. And at the regional scale, first attempts to couple hydrological and crop models started already in the late 70ties. A prominent example is SWAT (Soil and Water Assessment tool), nowadays also applied at the continental and global scale, and many other exist. At the global scale, the models ORCHIDEE and LPJmL have coupled water and crop modules etc.

Minor comments:

Page 3, last para: How do you define return flow?

Page 4, second para: “. . .the current state of LSMs is not capable of capturing agricultural processes in a detailed manner”. However, the literature cited is mostly older than 2010, and the most recent 2014. This is not the current state.

Page 6, first para: Does VIC consider reservoirs and other water management measures?

Page 10, last para: “As with other hydrological models, the VIC model needs to be calibrated . . .”. This is only part of the story: State of the art is to calibrate AND validate in a split-sample approach. So, are the results shown in Figures 5-10 from the calibration or from the validation period? If, for example, the results in Figure 7 are from the calibration period, I would expect them to be good.

Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-294, 2016.

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