



EGUsphere, referee comment RC3
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Comment on egusphere-2022-664

Anonymous Referee #3

Referee comment on "GEB v0.1: a large-scale agent-based socio-hydrological model – simulating 10 million individual farming households in a fully distributed hydrological model" by Jens A. de Bruijn et al., EGU sphere,
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This paper is quite ambitious in attempting to deepen and enrich the current state of the science around agent-based socio-hydrology modeling by reducing hydrological response units to individual farmholdings through the usage of a higher-resolution spatial scale. At the same time, it promises a fine-grain resolution on the large scale, but then explains that the agent behavior is simplified and that a large-scale model will be forthcoming in the future. For the most part, it is a valuable contribution that I enjoyed reading. However, I have a few questions and thoughts before publication.

1. It is unclear why the author has rendered a single farm into multiple HRUs when its holding expands beyond single grid cells. Does the inability to maintain one HRU per farm not detract from the representation goals of the study? Perhaps it does not, but an explanation of this . (Lines 85-86)
2. It is cautioned that the study is merely to showcase the model, but this feels dissatisfying somehow. A model is only interesting insofar as it is useful, and the reader needs more support beyond the vague notion that the authors enjoy hypothetical scenarios (Lines 365-367). Why is it not realistic? Is it stylized or semi-stylized? Does this effect its generalizability?
3. The elaboration of the findings and the conclusion are both insufficient. The paper's findings end strongly with the description of Figure 10, but there's little elaboration on what it means. There is in other words, scanty "discussion" of the model results. What do they tell us, the reader, in socio-hydrological terms (an expansion on socio-hydrology in the literature review could help with this)? Conclusions could also show further generalizability and the future potential for studies like this.

Saying that a large-scale model will happen in the future both undermines the initial claims of the article and fails to examine the purpose of the present one. In short, I think the paper ought to be revised in order to promise less at the beginning and offer more at the end.