

Interactive comment on “Impacts of future agricultural change on ecosystem service indicators” by Sam S. Rabin et al.

Anonymous Referee #2

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The main contribution of this paper is in coupling the PLUM and LPJ-GUESS models to project land-use change impacts in future scenarios, in terms of biodiversity impacts or greenhouse gas emissions.

As such, my main criticism of the paper is that the method section is not very detailed about (1) the assumptions of the two models, (2) the working of the two models, and most crucially (3) how these were combined. While I appreciate the difficulty of communicating complex models in a brief section, seeing that this is the central contribution of the paper, the reader should not be forced to go through the supplemental materials (which is also very densely presented) to understand the models and their interplay. This could potentially be presented as multiple tables and a joint figure exploring the interactions and basic properties of the models.

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Conversely, I would suggest to shift large parts of the input data sections to the SM, as (especially in the case of PLUM), these are largely technical details on the modeling side. Instead, the manuscript should spend more time in detailing the scenario setup, as well as how the “holding constant of certain variables” for the purpose of robustness checking was implemented, as based on the abstract and introduction this is a central part of the paper.

Minor comments

- The error bars in Fig. 1 and Fig. 3 are largely cosmetic, as the processes depicted here are highly persistent (e.g. population, cropland), and the error bars merely measure the standard deviations within a decade. The authors themselves do not interpret them within the text, so for the clarity of information they could be also left off. Indeed, if the authors would like to highlight the temporal dynamics, a representation of the whole time-series would be better suited. - In Fig. 2 it would be good to either have a different color scheme for the two columns or the same scale. - In the SM, figures for commodities and exports are presented (SR8, 10,11, 13). Here the trade patterns exhibit highly cyclical behavior, which might not be fully realistic. This should be contrasted with past export dynamics in the same crops and regions.

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