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.

Section 2 has been extensively reworked:

- Sect. 2.1 now focuses on LPJ-GUESS, with the text on ecosystem services having been moved to the Introduction and the new Sect. 2.5.
- Sect. 2.2 focuses (as before) on PLUM, now including some text about where it uses data from and gives data to LPJ-GUESS.
- Sect. 2.3 describes how the coupling works. This is necessarily very technical, but a flowchart figure is now provided for clarification.
- Sect 2.4, describing input data and scenarios, has been compressed significantly relative to the old Sects. 2.3.1–2. Technical information regarding data sources is now less prominent, with about half of the section serving instead to provide context about the SSPs and RCPs. For interested readers, the Supplementary Methods provide more technical detail.
- Sect. 2.5 focuses now solely on the ecosystem service indicators used in the study. Background information on the ecosystem services in question has been moved to the Introduction.

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.

Technical details are significantly less prominent in the new Sect. 2.3. The new Table 1, which describes the experimental runs, should clarify what it means for certain variables to be "held constant."

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.

The error bars in these figures (now Figs. 2 and 4) have been removed.

In Fig. 2 it would be good to either have a different color scheme for the two columns or the same scale.

This figure (now Fig. 3) has been updated. Among other visual changes, the two columns are now on 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 right not be fully realistic. This should be contrasted with past export dynamics in the same crops and regions.

The "jumpiness" of individual crops is due to shifts in which crops are used as animal feed. These shifts are due primarily to changes in relative prices of the different crop commodities. Note that the dotted lines, which exclude demand for animal feed, are much more stable. It is indeed unrealistic to expect, e.g., oilcrop production to triple from one year to the next, as would be required to satisfy the demand increase seen in the US and Canada in the early 2040s (former Fig. SR8, now SR9). For the purposes of our ecosystem services analysis, however, gross decadal trends in total agricultural area and management inputs are much more important than exactly what is being grown on cropland, and those gross trends are much smoother. Text explaining this has been added to Sect. 2.2 (PLUM).