

## ***Interactive comment on “The Land Use Model Intercomparison Project (LUMIP): Rationale and experimental design” by David M. Lawrence et al.***

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### General Comments

For this review I used the CMIP Panel's letter to the MIPS as a guideline for my review. Below the bold parts are how I see LUMIP authors responding to the letter.

These contributions will detail: 1. the goal of the MIP and the major scientific gaps the MIP is addressing, and will specify what is new compared to CMIP5 and previous CMIP phases. "The Introduction covers this topic well, particularly section 1.1."

2. The contributions will include a description of the experimental design and scientific justification of each of the experiments for Tier 1 (and possibly beyond), and will link the experiments and analysis to the DECK and CMIP6 historical simulations. "Section

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2 in the paper."

3. They will additionally include an analysis plan to fully justify the resources used to produce the various requested variables, and if the analysis plan is to compare model results to observations, the contribution will highlight possible model diagnostics and performance metrics specifying whether the comparison entails any particular requirement for the simulations or outputs (e.g. the use of observational simulators). "Section 3 in paper."

4. In addition, possible observations and reanalysis products for model evaluation are discussed and the MIPs are encouraged to help facilitate their use by contributing them to the obs4MIPs/ana4MIPs archives at the ESGF (see Section 3.3). "Discussed in section 2 and 3 of paper."

5. In some MIPs additional forcings beyond those used in the DECK and CMIP6 historical simulations are required, and these are described in the respective contribution as well. "Section 2 in the paper."

My summary is that the authors did a very nice job of responding to the CMIP Panel's directions. I have several specific comments below which I hope will further improve the paper.

#### Specific Comments

1. Page 2, Abstract, 1st line – Missing word. I think “changes” should go just after “large” and before “to the Earth surface”

2. Page 2, lines 29-30 – Should mention need for documentation of what the groups did to run the experiment. These details are at least as important to trying to follow the experimental design.

3. page 3, line 59 – 40% of radiative forcing – What is time period? When to when. . .

4. Page 6, line 142 – “industrial roundwood” – What is this? Please define.

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5. Page 8, section 2 – I think there should be multiple mentions of the need for documentation of what was done and how by the modeling groups. Each group's land model is quite different from the others. The details will be very important if we are going to be able to figure out the results after the experiments are completed.

6. Page 10 – Several references to Figure X – line 276, 282, 299. Please insert correct figure number. 6B. Page 11, lines 314, 333

7. Page 13, top – This discussion is confusing to me. Clearly discuss the various types of errors: model, forcing, observations.

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