

## ***Interactive comment on “A framework of benchmarking land models” by Y. Q. Luo et al.***

**Anonymous Referee #2**

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The paper raises a very important issue of evaluating land model performances. The study figures out which different aspects for land model evaluation have to be taken into account. It provides a summary about available data which are useful for benchmarking. But, unfortunately the paper fails providing a benchmarking protocol. It should be clarified that benchmarking is a measure of model performance as well as model validation is a part of this by evaluating model data against observed data. For some parameters there is even a lack of data and only a model intercomparison could overcome this to evaluate the uncertainty range of estimation. Many data listed in tables 2 and 3 are useful for validation on the local scale, but in my opinion all global data are model results. Especially should be distinguished much more precisely that some data only provide model intercomparison data. There are only few observed data which are useful for validation, but as already mentioned a benchmarking is lacking in this paper. The distinction between validation against observed data and model data has to be

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described more clearly. Many suggestions made by this study are already considered by many studies, e.g. the comparison against flux data as well as runoff data or fpar. What is really needed is a comprehensive study where all land models contribute to the estimation of the uncertainty of biophysical cycles. Even the attendance of disciplinary data models as GPP or soil respiration assessment methods would support the benchmark process. The study could contribute to this effort by structuring the benchmarking. Therefore it needs a more detailed analysis of which observations are useful and which model data at which spatial and temporal resolution should be used. Different input data has to be taken into account to capture this uncertainty as well.

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