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Interactive comment on "Continuous and consistent land use/cover change estimates using socio-ecological data" *by* Michael Marshall et al.

Anonymous Referee #2

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Interactive comment on "Continuous and consistent land use/cover change estimates using socio-ecological data" by Michael Marshall et al. The manuscript reports on a new method of improving LULCC estimates for the land model community, by using continuous 30-year estimates of LULCC driven and socio-ecological geospatial predictors in a machine learning exercise (Random Forest algorithm) for a specific region in Kenya (Africa). The authors claim that socioeconomic variable(s) can be utilized to reconstruct the LULCC estimates. Also, the non-remote sensing predictors in all cases out-performed that from remote sensing approaches or products.

Major concerns

It is quite a technical manuscript, which makes it hard to read and/or understand if you are not familiar with remote sensing and/or statistical lingo. I guess it is essential to

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Discussion paper

explain clearly how exactly things are done, but perhaps some parts could be in a box or supplementary material in order to enhance the readability for the not so informed reader. Or explain it in a simple way; e.g. The MSE is a measure of the quality of an estimatorâĂŤit is always non-negative, and values closer to zero are better.

The manuscript would be much stronger if they could demonstrate the applicability of the method for areas outside Kenya (the 'learning' area). Now it seems that the method only might work for those specific areas. What if the land use/cover is much different?

The authors write at page , lines 9-11: The purpose of this study was to propose a simple (functional) way to map LULCC at the macro-scale at 5 km resolution on an annual basis using socio-ecological predictors that are available pre-1981 and projected 50-100 years into the future in order to facilitate land atmosphere modeling and research". However, I could not find any paragraph in this manuscript referring to the 50-100 year into the future part, so what is the added value here?

I do not agree with the authors at page 4, lines 18-21 that integrated models are not widely used for macro-scale applications. For example, Integrated Models such as the IMAGE model (Stehfest et al. 2014) have been, and still are, at the core of many of the Model Intercomparison Projects for the IPCC (AGMIP, CMIP, LUMIP, etc).

Minor remarks Page 9, line 9. Explain first time use of term BIOCLIM

Table 2. 'Annually-changing variables are distinguished with a ".d" extension' should be at header of Table 3, no? And what does the .d stands for, annual would be more logical to be represented by an .a?

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