Earth System
Dynamics
Discussions

Interactive comment on "A global assessment of gross and net land change dynamics for current conditions and future scenarios" *by* Richard Fuchs et al.

Richard Fuchs et al.

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Comment_R1#1 It's a good paper.

Response_R1#1 We thank the reviewer for the positive and constructive comments and suggestions. Please see the detailed point-by-point responses below.

Comment_R1#2 -Methodology But there is no detail of method. Authors write the outline of the methodology. Please add details (equations).

Response_R1#2 We will expand the methods by more detailed explanation and where needed mention the equations in explicit or descriptive form. However, in order to

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stay within a reasonable page limit we will add some of the methods detail to the supplementary material.

Comment_R1#3 -Results Almost all results are not strange, but the grass loss in the arctic seems to be high. please add the explain.

Response_R1#3 This is a valid point. We discussed this already in the initial manuscript version and the supplementary material (Supplement S1 – Sect 4.). The grass loss in the artic involve land cover changes from grasslands to other land. We are aware that these particular changes are potentially too high. Some of the grass-land system classes occur in Tundra and semi-arid regions (e.g. Sahel). While the semi-arid regions are known for high land cover conversions rates, the Tundra region is not. Since we averaged all empirical changes amongst land system classes the high conversion rates of the semi-arid regions "spilled over" to the Tundra regions as well. We tackled this problem already in the methodology and will add a paragraph and some additional explanation in the supplement of the original document. However, the reviewer is correct; some overestimations for the Tundra remain. We will now clearly indicate in the discussions that an overestimation for this particular region may remain and that this should be considered in applications using our data.

Suggested change: "Nonetheless, an overestimation of this particular region, the Tundra, may remain. This should be taken into account in applications using our data." (pg. 17, line 23).

Comment_R1#4 -Discussion As mentioned in section 3, uncertainty is very serious. Misclassification leads gross land use change. this is the reason why land use moder don't use middle resolution remote sensing images. Please add much more discussion.

Response_R1#4 The reviewer is right that misclassifications in the empirical datasets may lead to an overestimation of gross land use change in some areas. We will elaborate more on this in the discussion. Although, in this paper, we present a collection of the most recent and advanced datasets available for land cover applications, uncer-

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tainty is an essential part of these datasets. Contrary to many other available products, we comprehensively document uncertainties in the underlying data. In that sense, we are able to account for uncertainty, while for many other products, without an accuracy assessment, this is not possible. In the methods and discussion section, we will expand the description of the different sources of uncertainty to inform the readers as best as possible and to enable them to judge the quality of the individual products.

Suggested change: "Especially in land change datasets, misclassifications from individual years add up, decreasing the overall accuracy of the change dataset. This may affect the magnitude of gross changes in our scenario by increasing the gross/net ratio." (pg.18, line 13).

Interactive comment on Earth Syst. Dynam. Discuss., https://doi.org/10.5194/esd-2017-121, 2017.

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