Response letter, 3rd revision of manuscript "Earth system modeling with endogenous and dynamic human societies: the copan:CORE open World-Earth modeling framework"

Following the editor's recommendations (communicated on Dec 24 2019 via email) below (quoted in *italics* below), we have produced a third revision of the manuscript. Changes in the text and updates and additions in the references in the paper and SI text are highlighted in red colour therein.

> *I've read through the latest version today and the reviews and responses. [...]*
>
> *There is the scope to seek to revise the paper in some considerable respects. Perhaps even reverting some of it back to a previous version. But I don't think that would be in anyone's interests. I have the following suggestions/observations based on the latest version.*

We thank the editor for this assessment and give a point-to-point reponse to his recommendations in the following:

> *1 - An important motivation is to promote copan:CORE to potential users. Rather than a "towards" paper, a paper that is in some sense a manifesto that argues that "something should be done", your manuscript alerts researchers to a new thing in the modelling world and asks them to use it. I would assume it would be critical that users are able to quickly and effectively get to grips with copan:CORE. I still get a 404 for the link http://pycopancore.readthedocs.io/ on the GitHub page. The only documentation I can see is very limited. This would also in part address some of the grumbles about reproducibility.*

1 - Thank you for pointing this out. We have fixed this error now and the full API documentation of copan:CORE is now online and accessible via github.

> *2 - There will always be some pointed skepticism about the role, place and utility of global socio-ecological models (e.g. World3). I wouldn't shrink from addressing some of them quite directly. Be open about that fact that some people/communities think they are very poor science. I think the power of your approach is that you are agnostics about modules. The proof will be in the pudding in that individual model formations will sink or swim on their robustness. You are providing the platform for model development. For the motivation of copan:CORE I think it's sufficient to point out that many of the key sustainability challenges we face intimately involve the sort of coupled dynamics and feedback loops that copan:CORE is designed to implement effectively.*

2 - We agree that it is important to mention these concerns and general challenges for integrated human-Earth system modeling more explicitly. We have added a corresponding paragraph to the introduction (at the end of Subsection 1.2). We have furthermore added references to several recently published papers that further strengthen the case for copan:CORE and World-Earth modeling and concretely discuss corresponding challenges and approaches to address them in much more detail (e.g. Calvin and Bond-Lamberty 2018; Beckage et al. 2018; Barton and the Open Modelling Foundation 2019; Schill et al. 2019 etc.). These and other papers really show that a growing community is moving in this direction and we hope that our article could bring this to the attention of ESD readers as well.

> *3 - But beyond offering a platform, I think you are also potentially looking at managing a community of modellers or at least a repository of copan:CORE models. How that is managed will I think be crucial. It would be great to see enthusiastic take up of the platform and many models being produced. But it would a missed opportunity if these models were not curated in some respect. We need to ensure the sum of the modellers efforts are greater than the parts. We need ways to share best practice for these sorts of models. Perhaps some copan:CORE tailored practices from Software Carpentry (https://software-carpentry.org) perhaps? I appreciate that is potentially way beyond the scope of the paper, but if this paper is the first exposure someone has to the platform then you will want some things in place to ensure you "capture" them and their outputs.*

3 - We now discuss in more detail this community building challenge and how copan:CORE is specifically designed to facilitate that in the conclusions (Section 4).