

Interactive comment on “Metabolic tradeoffs and heterogeneity in microbial responses to temperature determine the fate of litter carbon in a warmer world” by Grace Pold et al.

Anonymous Referee #1

Received and published: 16 August 2019

The manuscript by Pold et al. explores the temperature sensitivity of microbial carbon use efficiency through the use of a microbial explicit decomposition model. The authors have evaluated the effects of manipulating the plasticity of CUE and enzyme production for all microbial groups or for fungi and bacteria only. The topic of the paper is highly interesting and using a modelling approach allowed for separating different effects at various scenarios. However, the manuscript seems not to be as polished as it should be for me to be able to provide an in depth review at this time. There are some aspects of the manuscript, that can be easily dealt with but make it at the moment difficult to read and to follow the story. Especially when the authors refer to Fig.1, which could be a great roadmap to the different scenarios tested, there are almost always mix

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ups with which letter represents which scenario. This already starts with the figure caption. The figure itself also looks kind of distorted, at least in the pdf that I got. Lines that should be straight are not and dots are not round. In Figure 3 the legend suddenly brings up the categories 'continuous' and 'discrete', which have not been mentioned before and are not explained in the figure caption. In figure 4, the order of categories is 'decrease', 'increase', and 'none', while in the corresponding section in the manuscript it is different. Also in figure 4 there is a graph with an axis title that says 'CUE at 15°C' and one with just 'CUE' what is the difference? The reference list includes duplicates. A lot of the data that is mentioned in the text is not shown in any graphs or tables or wrongly referenced to e.g. lines 204-207. All these little things that are not grave individually make it difficult to read the paper and follow the story and make it hard for me to provide more detailed comments on the underlying science at the moment. I am however very interested in doing this, once the authors provide a more polished version of the manuscript. At this point I only have a few more general comments. 1. The title as well as the abstract are quite catchy but I think are overselling what the results of the paper show. Especially since the authors themselves state that their findings partially contradict findings from other modelling studies and empirical evidence is lacking. While the arising new concept and the new hypotheses that come with it are interesting they should be treated as such and the authors should tone down their wording, especially in the title, abstract and in the sub-headline in line 159. 2. The forth hypothesis is not very well introduced before

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2019-269, 2019.

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