

Authors' Response to Community Comment 1 (BGD bg-2021-37)

May 11, 2021

The over all importance of the study for a multidisciplinary and interdisciplinary readership is unclear. The manuscript addressed modeled greening. After carefully reading over several hours I inserted some comments in the attached manuscript. The role of carbon dioxide enrichment seems in general unclear. The species-specific response need to be included and discussed with reference to the species prevalent in the biomes. The manuscript is overall very detailed on the methodological approach.

We thank Oliver Dilly for his interest in our study and for taking the time to carefully read the manuscript. We consider the content and significance of this study and the way it is presented in the manuscript to be very appropriate for the EGU journal Biogeosciences and its readership. Also, we are confident that we carefully describe and explain the role of carbon dioxide enrichment in the manuscript (physiological versus radiative effects of rising atmospheric CO₂, please see LL33 onwards). Furthermore, an analysis of species-specific responses for individual biomes is not appropriate in this study, primarily because global land-surface models do not usually resolve biodiversity at the species level, but rather at a conceptual "plant functional type" level. Nevertheless, we thank Oliver Dilly for his suggestions.

1 General Comments

1.1 Results and discussion should be separated. This should allow the separation of the modeled in comparison to evidence-based effects of the greening including the role of carbon dioxide, for a multidisciplinary and international leadership of biogeosciences.

We have chosen to present and discuss the results jointly, also in light of findings from other published studies, by taking the reader from the global analysis through the individual sections for different biomes. Each section begins with an illustration and discussion of our findings, which are then placed in the perspective of our current understanding. We believe this is the best way to communicate the results of this study to the readership.

1.2 These points and comments from earlier comments in the discussion should be carefully included in the MS.

We again thank Oliver Dilly for his comments and annotations in the manuscript, which we will take into account when preparing the revised version of the manuscript.