

Interactive comment on “Projected global tropospheric ozone impacts on vegetation under different emission and climate scenarios” by Pierre Sicard et al.

Anonymous Referee #3

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-General comments This is an interesting scientific study to evaluate the future impacts of ozone on vegetation. The authors tested the different RCP scenarios and compared results by the six global chemistry models. The topic is very actual and the study is carefully done. The results are an important basis for further developments on future ozone risks for global vegetation. There are only a few minor remarks.

-Specific comments

L142 "when the stomatal conductance is greater than 0": what do you mean? Do you mean the "leafy season"? Please rephrase it.

L147 "the overestimation of AOT40 does not affect our results": it is not clear why.

C1

Please rephrase it.

L170 not "per unit of ozone-uptake" but "per unit of AOT40"

L172 Again you did not use "ozone-uptake" in Eq. (2). You can describe it as "regressions of the photosynthesis response to ozone (Reich, 1987)".

L173 What are the "other vegetation types"? And please justify why the photosynthetic responses to AOT40 are same between deciduous trees and "other vegetation types".

L464-465 Nemani et al. (2003) and Zhu et al. (2016) did not show the ozone impacts. Please revise it.

L480-481 "In these areas, the increasing effect of a warming...": where can we refer for this result? Please specify it.

L491-496 "mainly due to the lack of empirical data about the response of different species to O₃": We have to say that this is a weak rationale. In fact, Sitch et al. (2007) considered five plant types (broad-leaved tree, needle-leaved tree, C3 crops, C4 crops and shrubs; please see the Table S1 of their paper). But we can find a marked difference in estimated ozone concentration in 2100 between this study (Fig. 1) and Sitch et al. (2007). A major advantage of this study is a comparison between the models and scenarios. The authors should reconsider the sentence and should emphasize what is the need to explore future potential impacts of ozone.

L553-560: I agree with the statement. However, if so, readers are wondering why AOT40 was targeted in this paper. The authors can put more "take-home messages" for readers. For example, what is a climatic condition (arid/humid) in high AOT40 regions? How about the need for a parameterization of the ozone dose-response relationships in tropical plants? ...etc.

L578 "the lower risk areas include evergreen broadleaf forests ": we cannot find the description about the parameters in evergreen broadleaf forests (lines 170-174). Did you target this plant type?

C2

Figure 3 legend: “the potential ozone impact on vegetation“: of what? Maybe photosynthetic assimilation. But please specify it.

-Technical corrections

L551 “..South Asia they may.“: you had better put “, and” before “they may”.

L552 not “were” but “was”

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-74>, 2017.