MS Title: Future projections of Siberian wildfire and aerosol emissions by process-based ecosystem model

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Review of first revision

General Comments

The author's revisions have improved the overall quality of the manuscript. In particular, I appreciate that the authors first evaluate model performance before assessing the future projections. The incorporation of a fire module into a DGVM is an important and non-trivial task and I would like to congratulate the authors on having achieved this. However, the manuscript still reads more like a report than a scientific paper. This is because the authors tend to document all of their findings, rather than focusing on the more interesting ones. While the approach is thorough, it makes the manuscript hard to read. The authors have addressed most of my previous comments to my satisfaction. However, I still have a number of comments below for the revised version of the manuscript. I hope you find my comments useful.

Detailed Comments

L1 The title "Future projections of Siberian wildfire and aerosol emissions by process-based ecosystem model" is grammatically incorrect. It would be "produced by" or "made by", or "conducted with a". Personally, I would reduce the title to "Future Projections of Siberian Wildfire and Aerosol Emissions".

L5 Replace "Fires" with "Wildfires"

L18 You don't want your abstract to be wordy. Delete non-essential info, such as "spatially explicit individual-based"

L21 Revise grammar

L21 Avoid acronyms in abstract (other than R^2 and RMSE). If you need them, you need to spell them out first, e.g. AGB. In this context I would omit the names of the reference data sets, such as GFED4s.

L24 What "data"? Also, does "numerically" refer to spatial mean values? Rewrite to omit ambiguity.

L26 Replace "climate scenario" with "climate change scenario"

L27 Rather than the increase rate, can you please provide the relative change between 20-year mean historical period against 20-year future period? A relative change between two periods is more intuitive than an increase rate.

L29 What fraction of trees is this? How does this fraction compare to the historical run? I am asking these questions because from the absolute numbers it is not clear how large the impact is. It is easier to grasp when you write for instance, that the amount of trees burnt increases by a factor of three.

L43 What does "human activity" refer to in this context?

L49 What is "global mean CO_2 emission intensity" referring to? Are you referring to the annual rate of global total CO_2 emissions? Does "NS" refer to Northern Hemispheric Summer?

L51 Why "as well"?

L61 You write that "Prolonged exposure to high CO_2 concentrations has negative impacts on health and agriculture". Concerning health, that is indeed true but for very high concentrations of CO_2, not atmospheric concentrations. For agriculture, high levels of CO2 can be beneficial. I think the relevant negative health impacts are more related to the emission of particular matter, rather than CO_2.

L63 This feedback is important, please elaborate.

L68 Revise grammar

L75 Explain what you mean by a negative impact.

L171 Replace the underline with a bar in Equation (2) to make the notation consistent with the one used in the text.

L172 Grid cells is plural

L182 Start line with "where" and please avoid using 3-nested parenthesis.

L187 LCT is not yet defined

L188 The PFT names are not yet defined, and please don't start a sentence with an acronym

L195 I would delete these two sentences on the verification process. I think it is self-understood that you make sure everything is working properly.

L232 Delete superscript ("inputs^2")

L233 Why is the "MirocAR5 Base V2 dataset is generated from CRU TS3.22 climate data"? Miroc is a climate model. Do you mean that the Miroc version you used as bias-corrected with CRU? Please clarify.

L241 The term "saturation" does not fit here.

L243 Write "The SEIB-DGVM code modifications" and revise grammar. I suggest you rewrite the sentence as two sentences.

L249 Revise grammar

L318 Remind the reader what this core variable is

L375 Revise grammar

L498 Write "because it is"

L499 You write that "Based on the comparison of results between the fire-on and fire-off simulations, the NPP variable under all of the RCP scenarios shows a downward trend with some small fluctuations". It sounds as if the difference between simulations with fires on and off reveals a trend in NPP. I am sure this is not what you mean to say, please rewrite.

L565 FDI not defined

L642 Replace "dan" with and"

L649 Revise grammar

L655 Please avoid sentences like these. Instead of copying the raw data from the table, facilitate its interpretation.

L654 Replace "Heterotrophic" with "heterotrophic"

L660 Does this apply to all of the RCPs that you assessed?

L661 Why "saturated"?

Figures

Figure 5 Replace "Kg" with "kg" in figure legend (here and elsewhere). Also, increase font of x-axis, and consider replacing the full month names with their first letters (J, F, M, etc.)

Figure 8 The burned biomass should have a time unit as well (mass per unit of area per unit of time). Add GlobFIRM and SPIFIRE to the (c) and (d) panels, respectively, such that the difference between both plots is more obvious.