

Geosci. Model Dev. Discuss., referee comment RC1
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Comment on gmd-2022-143

Anonymous Referee #1

Referee comment on "PVN 1.0: using dynamic PFTs and restoration scenarios to model CO₂ and CH₄ emissions in peatlands" by Tanya Juliette Rebecca Lippmann et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2022-143-RC1>, 2022

The manuscript describes and tests a new site-level model suitable for restored peatlands incorporating dynamic vegetation to estimate GHG fluxes. This is a very much needed tool, as long term restoration project are still few in number and monitoring/measuring the changing GHG fluxes over years is a needed but tedious task. A well operating model could offer us a sight into future (as well as past).

There is yet one issue that bothered me a lot during the review process, making the process almost impossible. After reading the MS I do not know what is the sign convention you use for NEE, CO₂. The figure3 indicates that positive NEE is net CO₂ uptake, which would be logical as plants are more active during summer. Yet in the text you talk about CO₂ emissions. This bothered me enormously as it affects interpretation of all the results. For this reason this review is not "completed".

Secondly, the text is very hard to follow. There are so many abbreviation that the reading would require memory of an elephant. In addition to me it seemed that in result sections same issues are repeated under different subheadings. Please try to review the text carefully for the next version of the MS.

Thirdly, I am not an expert on model related issues, so I am not able to comment the model structure or process. Hopefully there is someone else for that task.

I have listed here also some more detailed comments, but I do feel that proper review process is not possible at this stage.

pg12 l285: what was the size of the automatic chambers? in a photo they look rather

small in comparison to the height of the vegetation

Fig 3a: what is the sign convention here? is positive CO₂ uptake and negative CO₂ release. Is the orange line PV_HORST correct? it basically does not go under zero at all, indicating that there is either no netCO₂ uptake at all even at high summer or that there is no net release...

pg 18 l407: the list of abbreviations here is just too much

pg18 l415: and what?

pg 19 l431: is net GHG budget emissions when positive

pg21 l454: can abandonment be used as a restoration scenario? would restoration not need some activity?

pg23 l480-485: when you compare these scenarios, should you also consider what happens to the harvested biomass? it is likely decomposing and emitting CO₂

pg23 l491-500: excuse me but how is this text related to the site properties? this is just a comparison of the scenarios

pg 23 l511: how was the LAI for mosses defined? this is something very new to me. more so the value seems extremely high

pg28 l607: what is this at the beginning of the sentence? (refer to PFT results and maybe shorter)