

Dear Editor,

Thanks so much for sending us the reviews on our manuscript “**The effects of carbon turnover time on terrestrial ecosystem carbon storage**” (ID: bg-2017-183). We are very grateful to the reviewers for their constructive comments and suggested amendments. We have carefully studied the reviews, and revised our manuscript accordingly. We also asked a native speaker Shahla Hosseini Bai, to carefully revise the manuscript.

Here are our detailed responses to the reviews. Please note that the comments are in *italics* followed by our responses in **regular** text. In addition, we marked the changes or revision with **the red text** in the whole revised manuscript.

Yours Sincerely,

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Response letter to comments (ID: bg-2017-183)

Referee #1

General comments:

There do remain a few problems: terms need to be carefully defined, some improvements for readability would be useful, and the ms still needs careful editing for English usage throughout—see specific comments below.

[Response] We carefully defined the terms again, and asked a native speaker Shahla Hosseini Bai, to carefully revise the manuscript again. Hope the language has been considerably improved.

Specific comments

1. Line 21: need to define NPP and GPP

2. L. 33: “deserve further”

[Response] Done as suggested.

3. L. 77: probably start new paragraph

[Response] Thanks for your suggestions. This paragraph showed the main methods to estimate the C turnover time and their pros and cons. Since the ratio of C storage to flux is one of the methods for C turnover time estimates, we did not start new paragraph.

4. L. 97-102: not sure this should be here; delete or move to methods?

[Response] Done as suggested. We deleted it.

5. L. 167-169: for the future, note Hashimoto et al. datasets:

<http://cse.ffpri.affrc.go.jp/shojih/data/index.html>

[Response] Thanks for providing the data link about global gridded soil respiration. We deleted the sentence “However, it is difficult to accurately get the observed respiration (R_a and R_h) in terrestrial ecosystem at the global scale.” in the revised MS.

We would consider the soil respiration into the estimate of C turnover time in the future.

6. L. 222: *again, if you use R, please cite it correctly*

[Response] Done as suggested. We added the specific citation in revised MS

(“through Markov chain Monte Carlo (MCMC) sampling from a gamma distribution (CRAN: MCMCpack, Martin, et al., 2011)”).

Martin, A.D., Kevin, M. Q., and Jong, H.P. 2011. MCMCpack: Markov chain monte carlo in R. J. Stat. Softw. 42.

7. L. 247: *“longest...shortest”*

8. L. 419: *“and perhaps catastrophically”*

9. L. 453: *be more positive! “Our results provide insights...”*

[Response] Done as suggested.