

***Interactive comment on* “Spatial and temporal patterns of plantation forests in the United States since the 1930s: An annual and gridded data set for regional Earth system modeling” by Guangsheng Chen et al.**

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This study reported a time-series spatially-explicit forest plantation data and generation methods for the conterminous US during 1928-2012. The dataset is very important and beneficial for the modeling community to estimate the impacts of human activities on carbon, water and nitrogen cycles in managed forests at national or regional scales, which are currently lacking in the assessments of global and regional carbon, nitrogen, and water budgets. This manuscript is generally written well; some improvements in writing and presentation are needed, see below comments. The data generation

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methods and implications are clearly described. I would like to see a moderate revision before publishing in the journal.

Response: Thanks for the positive comments and precious suggestions. We accepted all your comments and suggestions and have carefully revised the manuscript accordingly. We summarized your points and responded as below.

Specific comments and suggestions: The assumption of plantation area did not decrease (line 209-215), needs justification. The assumption of plantation area did not decrease (line 209-215), needs justification. “In this study, we assumed that the plantation forest area did not decrease with time.”

Response: This issue has also been pointed out by the other two reviewers. This assumption is made based on the assumption “plantation forest is not converted back to naturally-regenerated forest”.

Line 83: “are monitored” should be replaced with “are being monitored” since these activities are ongoing work.

Response: It is revised.

Line 110: “section 2.7” should be clearer. Suggests change to “see Section 2.7 for more details”. Response: It is revised.

Line 153-155: hard to understand. Modifications are needed. Response: We slightly modify this sentence to make it clearer in the revised version.

Line 178-179: more details are needed for the descriptions of species area data from Oswalt et al. (2014). Response: We slightly revised this sentence to add more information about the plantation species data from Oswalt et al. (2014).

Line 193: “not” is missed before “yet” Response: Thanks for pointing out this mistake. It is added.

Line 196-197: a little confused. Suggest a modification. Response: To make it easier

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to understand, we cut this sentence into two.

Line 218-219: “the annual plantation forest area data” should be “the annual planted area data”. “and” should be “with”. It is easily to be confused about the “plantation area data” with “annual planted area data”. Is there any better representation to easily distinguish the difference?

Response: It is revised. Yes. It is a little confused between “annual plantation forest area” and “annual planted forest area”, with “annual plantation area” representing the status of total plantation area while “annual planted area” representing the annually newly planted tree area. To make it easier to distinguish the two concepts, we replaced all places of “annual planted forest area” with “annual planted tree area”. Hope this alteration can be less confused.

Line 226: I am not quite sure what does the “j” represent. A little clearer explanation here? In addition, “N” in the equation is not explained.

Response: The explanation to N is added “N is the total numbers of years during inventory period p to p+1”. Explanation to “j” is slightly modified to “j is the number of year (0-N) during inventory period p to p+1 for plantation forest area”. For example, between the two inventory periods of 1999 and 2007, N is 18, while j is from 0 in 1999 to 8 in 2007.

Line 252: “Ai” need to change the format. Response: It is revised to “Ai”.

Line 265: is the per decade change during the 1950s calculated as the change from 1940s to 1950s or from 1950 to 1959?

Response: It is calculated as the latter method, i.e., $= (A_{1959} - A_{1950}) / A_{1950} * 100\%$.

Line 300: Smith et al. (2012) is not listed in the reference. It should be interesting to add a little more discussion here to discuss the future projection.

Response: Thanks for pointing this out. We cited a wrong paper here, it is actually

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Wear and Greis (2002). We add a couple of sentences following the citation to describe their predictions and infer the future plantation area in 2060..

Line 310: “a small” should be “small” Response: It is revised.

Line 443: better to move the citation to the end of this sentence Response: It is revised.

Figure 9: the graph for 2012 seems sheltered by the legend. Response: It is revised.

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