

## ***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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Response: Thanks for your precious and positive comments. We summarized your points and responded as below.

1. why add random error Epsom\_mn here?

Response: This random value Epsom\_mn is given to discriminate the grid cells with the same fractions of plantation forests. For example, if two (or more) grid cells have the same fractions (e.g., 0.526), then two random values (very small values; e.g., 0.0001, 0.00012) will be added to these two grid cells. The fractions of these two grid cells

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are altered to 0.5261 and 0.52612. If the determining mechanisms (The identification methods described in section 2.7) identifies only one grid cell is required to match the targeted (observed) grid numbers for plantation, then the first grid cell is not identified as plantation, while the latter is plantation. If no Epsom\_mn, both grid cells will be identified as plantation and then the total identified grid cell numbers will be more than that of the targeted (observed) plantation grid numbers.

2. L234-236: But in reality, some plantation forests might return to naturally-regenerated forests after harvesting. How would this influence plantation maps?

Response: Yes, there are possibilities for the conversion of plantation forests back to naturally-regenerated forests. Since we are lack of long-term and more detailed plantation distribution information, we have to make this assumption to approximate the historical plantation distribution patterns. It is difficult to quantitatively assess the impacts of this assumption. This assumption might have less impacts in USA as compared to other worldwide regions since most plantation forests are owned or managed by private forestry corporations.

3. L264: Plantation Fig. 1: Determining mechanisms. It is not clear what are the mechanisms here?

Response: The determining mechanisms refer to the program/methods (described in Section 2.7) to identify which grid cells belong to plantation. We replace the “determining mechanisms” with “determining program (Section 2.7)” in the revised version.

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