This study developed a 30 m young forest age map in China using Landsat images covering the period of 1990 to 2020. I found this study quite interesting and I like this idea. The approach used was straightforward and well validated. I have two major suggestions. First, a substantial amount of the contents in sections 4.3&4.4 are discussion. Suggest to reorganize these parts. Second, it's good to see the sensitivity test in this study (the analysis of key parameters in section 4.2). This help strengthen the validity of the parameters used, but this is always tricky for spatial data. My concern is that China's forests are greatly varied and how to validate that the five areas chose are representative?

Response:

Thank you very much for your positive comments and constructive suggestions. We have carefully considered your comments and have responded as follows.

First, Sections 4.3&4.4 in this manuscript will be considered moving to the discussion section.

Second, we selected five areas to confirm the threshold of key parameters for estimating forest age using the CCDC algorithm. These five regions come from northeast, central, southwest, eastern, and southern China, and the forests in these areas account for the main part of forests in China. But as you said, it is possible that these five areas do not completely represent the forest characteristics of entire China. To this end, we are consider include more test areas in the new version, especially in the western and northern regions of China.

Other minor suggestions:
1. In Table1, the author listed all the gridded data used. I think the forest definitions might differ between these datasets. Have you consider the definition differences and how you deal with this issue? Does it affect the results?

   Response:
   We totally understand the reviewer's concern. The definition of forest is not uniform across these datasets. However, it will not affect the validation samples generation and its quality, because we only sampled from the consensus area (described detailly in Section 3.3). In other words, the undefined areas of forests due to different definitions will not be considered to generate regrowth samples.

2. Line205, 'too large' -> 'too high'. Same to Line206, because sensitivity should be described by high/low.
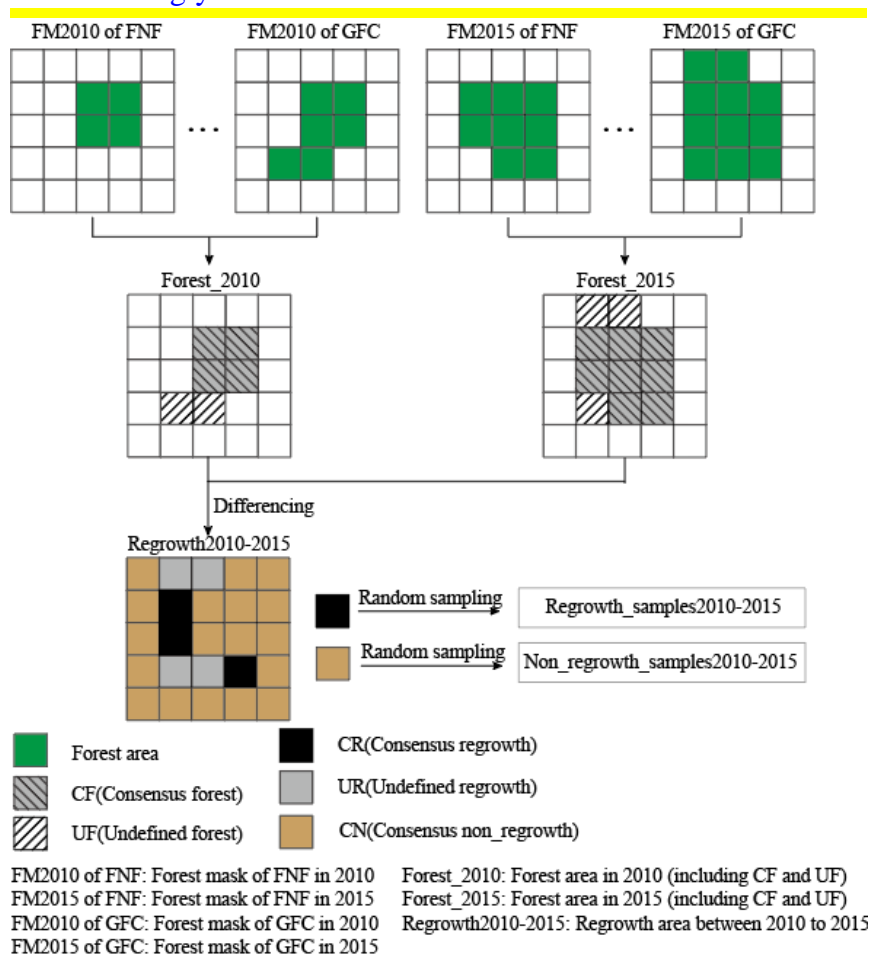
   Response:
   We thank the reviewer for pointing out this issue. The statement of 'too large' has been modified accordingly.

"For example, if the sensitivity is too <mark>high</mark>, then slow forest degradation (owing to insect pests and selective logging, etc.) will also be detected as breakpoints. Because there is no land cover type change in this process, a <mark>high</mark> sensitivity will lead to an underestimation of forest age…"

3. For figure5, why the second column forest grids were all classified as UF? For 2015, forest was identified in the second column of the 2nd and 3rd rows of the both datasets. Seems these two grids are also regrowth forests according to the classifier defined. Also, there is a typo of 'includiing', which shoud be 'including'.

Response:
Thank you so much for your careful check. These two grids you mentioned belong to the regrowth forest, so we modified Figure 5. Also, the spelling mistakes were corrected accordingly.

Figure 1. Validation samples generated using LULC products.

4. Line272, I am not very clear how the validation sample sets were generated. Could you provide more information here?

Response:
Thank you for pointing out this issue. The validation sample were generated by

auxiliary datasets (Table 1). First, we confirmed the area of consense regrowth (CR) and consense non-regrowth (CN) with four periods (such as 2000–2005, 2005–2010, 2010–2015 and 2015–2020). Second, regrowth samples and non-regrowth samples were randomly generated from CR and CN of each period, respectively. As a result, we obtained 2618 regrowth samples and 21007 non-regrowth samples.

"(3) Random sampling and confusion matrix calculation. Stratified random sampling was used to generate validation sample sets. First, we confirmed the area of consense regrowth (CR) and consense non-regrowth (CN) with four periods (i.e., 2000–2005, 2005–2010, 2010–2015, and 2015–2020). Second, about 1000 regrowth samples and 5000 non-regrowth samples were randomly generated from CR and CN of each period. Considering the possibility of regrowth events occurring in each period within the same pixel, only the regrowth samples in the most recent period were retained for the regrowth samples in the four periods. As a result, 2,618 regrowth samples (red dots in Figure 6) and 21,007 non-regrowth samples (blue dots in Figure 6) were obtained."

5. Line289, 'smaller'->'lower'

   Response:
   We thank the reviewer for pointing out this issue. The word 'smaller' have been replaced by 'lower'.

   "The provinces with relatively weak classification performance were Gansu, Jiangxi, Shaanxi and Beijing (in order), and the OAs of these four provinces were lower than 60%."

6. Line308-309, better rephrase this sentence: "more ... than ...". It is not appropriate to compare these two since your data only limited to young forests, while MPI-BGC covers all ages.

   Response:
   We gratefully appreciate your valuable suggestion. We have rewritten this part according to your suggestion.

   "...depict the age of these forests. The forest age map produced in this research presents clear information at the 30 m spatial resolution, which is helpful for monitoring small-scale deforestation activities and estimating land-atmosphere carbon fluxes."

7. Line318, why randomly selected samples but not all the regrowth data?

   Response:

Thank you so much for your careful check. We only randomly selected 10000 samples to calculate Pearson's product-moment correlation coefficient, because 10000 samples can basically reflect the relationship between two data. However, using all the regrowth data is time-consuming and we should consider the limits of GEE's computing power.

8. Lines 403-404, This may not be the case. For example, it could be the reason that the forestation areas remained the same but the forest establishment (tree survival rate) was lower in recent decade. To make this claim, you need to refer to the data of forestry yearbook.

Response:
We gratefully appreciate for your valuable comment. Indeed, the lower rate of tree survival after 2000 also could be the reason. So we referred to the 5th, 6th, 7th, and 8th national forest inventory data and found that the area of net gain planted forest is 102,520, 65,924, 84,311, and 76,416 km^2 during 1994-1998, 1999-2003, 2004-2008, and 2009-2013, respectively. It means that there was less planted forest after 1999, which may be the reason. According to this, we rephrased the sentences of Lines 403-404.

"We referred to the 5th, 6th, 7th, and 8th national forest inventory data and found that the area of net gain planted forest is 102,520, 65,924, 84,311, and 76,416 km^2 during 1994-1998, 1999-2003, 2004-2008, and 2009-2013, respectively (Liu et al., 2021). It means that there was less planted forest after 1999, which is consistent with our findings. Another reason may be that the country's early policies (specifically, the Returning Farmland to Forest Program and the Afforestation Program) were implemented effectively, and by 2000 many areas suitable for afforestation had been occupied."

9. Line426-428, Yes, this is reasonable. Suggest to use eucalyptus, which has been widely planted in Guangxi and Guangdong, as an example. Eucalyptus is a fast growing species and is generally harvested in 5-10 years.

Response:
We thank the reviewer for the nice suggestion. We have re-written this part according to the reviewer's suggestions.

"On the other hand, a large number of eucalyptus plantations were distributed in southern China, leading to young forest regrowth in the south."