

## ***Interactive comment on “The relative contributions of forest growth and areal expansion to forest biomass carbon sinks in China” by P. Li et al.***

### **Anonymous Referee #2**

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The paper by Li et al. summarises the changes in forest biomass carbon stocks in China's natural forests and plantations. Using inventory data they assessed the relative contributions of area expansion and increasing forest biomass carbon density over time and by Province in China. This paper is straight forward, shares valuable insights that are difficult to obtain without access to Chinese forest inventory data, and provides clearly presented results.

My comments are minor and should be easily addressed by the authors prior to acceptance. It would be useful if the authors could clarify in the methods whether their estimates are aboveground biomass only or whether the expansion factors include root biomass. Although the title makes it clear that the estimates are limited to forest

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biomass C, in a few places the authors leave the impression that they discuss the entire forest carbon sink. Somewhere in methods and/or discussion an additional sentence would be useful to make it clear that dead wood, litter and soil C stock changes are not evaluated. Thus, actual carbon sinks are probably larger than those reported for forest biomass alone.

P9588-10 : “China's forest C sinks from 1977 to 2008.” – must change to “China's forest BIOMASS C sinks from 1977 to 2008.” Because as the title says – this study is limited to changes in biomass – and it would be useful if the authors stated clearly that this is limited to aboveground biomass.

P9588-19: “subject to persistently-increasing forest growth after establishment of plantation” – Persistently-increasing forest growth is not something that is possible – growth rates always level off eventually – so perhaps sustained growth or some other wording would be more appropriate here.

P9589-7: China has the fifth-largest forest area of any country in the world . . . can you please insert the actual area estimate in parentheses?

P9589-23: “is useful to developing the method estimating the change in forest biomass C stock driven by different causes” suggest – “is useful to develop the method to estimate . . .” and add period at the end of the sentence.

P9591-3: “Note that due to a lack of data, forests in Hong Kong, Macao and Taiwan were not included in this study.” Please delete this sentence – this could be misinterpreted as a political statement that is inappropriate in this paper.

P9594-4: “In contrast to planted forests, increased biomass density of natural forests was a greater contributor to the C sink (892.1 TgC) than areal expansion (60.4 vs. 39.6%)”. In all other sentences prior to and after this one you have listed area expansion before stock increases and I suggest you keep this pattern. To maintain consistency rephrase the sentence and report the ratios as (39.6 vs 60.4%).

C3706

P9597-17: “while northern China become wetter” – change become to became . . .

P9598-27: “have faced long-term deforestation pressure, especially from commercial logging (e.g. timber extraction) and land-use change (e.g., farming)”. You need to be very clear here as to whether the commercial logging follows a land-use change, in which case it is deforestation, or whether regeneration follows, in which case this is not deforestation or land-use change. International definitions are very clear that logging followed by reforestation is not deforestation.

P9599-5: “areal contraction was responsible for all of the C loss in the late 1990s” – this should probably read . . . was responsible for the NET carbon loss – because this is all you evaluate here and gross carbon losses will be higher than the observed net losses. To state “all C losses” implies gross C losses and you have not evaluated these here and you just stated that industrial harvesting also contributed to carbon losses.

P9600-4: “China are credited” – China is credited

P9600-7: “Used forest identity and CFID” – Using forest . . .

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