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Interactive comment on "Modeling the uncertainty of estimating forest carbon stocks in China" *by* T. X. Yue et al.

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01ïijL'Localization of LPJ-DGVM The plant functional types (PFTs), such as boreal, temperate and tropical forests, originally defined by LPJ, could not perfectly match the geographical characteristics of forests in China. Therefore, we take the Vegetation Map of the People's Republic of China on a scale of 1:1000000 as a reference (Editorial Committee of Vegetation Map of China, 2007). The modified plant functional types include cold temperate and temperate deciduous coniferous forests, cold temperate and temperate mountainous evergreen coniferous forests, temperate evergreen coniferous forest, subtropical evergreen coniferous forest, subtropical and tropical mountainous evergreen coniferous forests, temperate deciduous broad-leaved forest, subtropical deciduous broad-leaved forest, subtropical deciduous evergreen forest, tropical seasonal

forest and tropical rain forest as well as C3 perennial grassland. There is almost no C4 perennial grassland in China. The localized PFTs are derived from the original LPJ PFTs, but several original LPJ PFTs have been deleted and several new PFTs have been derived. Thus, new parameter sets for LPJ are developed in this paper (Table 1)ãĂĆ Reference Editorial Committee of Vegetation Map of China, 2007. Vegetation Map of the People's Republic of China. Geological Publishing House, Beijing.

02ïijL'Cross-validation Cross-validation (Hulme et al., 1995; Holdaway, 1996) is used to estimate how accurately a model performs in this paper. References Hulme, M., Conway, D., Jones, P.D., Jiang, T., Barrow, E.M., Turney, C.: Construction of a 1961-1990 European climatology for climate change modelling and impact applications, Int. J. Climatol, 15, 1333-1363, 1995. Holdaway, M.R.: Spatial modeling and interpolation of monthly temperature using Kriging, Clim. Res, 6, 215-225, 1996.

1ïijL'and 2) The section 1 and section 2 will be combined into one section of introduction and be shortened to less than 900 words.

3) The "Experimental design" section will be divided into two sections, data and materials section and methods section.

4) The text from line#21 to line#26 on page 19551 will be moved to the data and materials section.

5) The biomass carbon stock and biomass carbon density are respectively abbreviated to BCS and BCD instead of CS/MACS/AMCS and CD/MACD/AMCD.

6) In the discussion section, line 19 through line 24 on page 19554 is to be deleted.

7) The equations (8), (9) and (10) indicate that increasing rates of BCS, BCD and FA were 0.531 Pg, 0.125 kg/ m2 and 0.083 million km2 respectively in a five-year period on the average. According to the equations (11) and (12), BCS of evergreen broad-leaved forests had a growth rate of 0.312 Pg in a five-year period, which was 0.113 Pg higher than the one of deciduous broad-leaved forests because of the different

increasing rates of BCD; the BCD of evergreen broad-leaved forests increased by 1.87 kg/m2, while BCD of deciduous broad-leaved forests did by 0.18 kg/m2 from period 1 to period 5. The equations (13) and (14) show that carbon stocks of evergreen coniferous forests grew much faster than the one of the broad-leaved and coniferous mixed forests; the former was 0.207 Pg but the latter was only 0.076 Pg in a five-year period on an average because the area of evergreen coniferous forests was 0.50×106 km2 while the one of the broad-leaved and coniferous mixed forests was 0.09×106 km2 although the BCD growth rate of the former was 0.132 kg/m2 but the one of the latter was 0.56 kg/m2 per five-year period.

8) The results from Kriging and HASM-SOA exhibit a similar spatial pattern on national level, especially in southern Tibet, Xiao Hinggan Moutains, Changbai Mountain and south China; the dissimilarity between their results happen in Taiwan and Xinjiang as well as Qinling Mountains. Comparing with HASM-SOA, Kriging is strongly influenced by sample-plot density. Spatial heterogeneity of the results from SOA is not so obvious because NDVI, a critical variable of SOA, is not so sensitive to a change of carbon stocks, especially in northeast China and lower reaches of Yangtze River. Results from LPJ are quite different from other methods, LPJ underestimates carbon stocks in Tibet plateau, northeast China and Xinjiang but overestimates carbon stocks in south China. LPJ is affected by climate pattern obviously but human activities have greatly modified the spatial pattern of carbon density in China.

9) The BCS growth was contributed by already existing forests and newly planted forests. The former accounted for about 55% while the latter about 40%. The existing forests had a growth rate of about 0.55 kg/m2 per five-year period nut the newly planted forests only about 1.8 kg/m2. Other factors will be discussed in another preparing paper because huge work needs to be done for this.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/12/C10235/2016/bgd-12-C10235-2016-

supplement.pdf

Interactive comment on Biogeosciences Discuss., 12, 19535, 2015.