Editor Initial Decision: Publish subject to technical corrections (17 Oct 2014) by Nobuko Saigusa
Comments to the Author:

I would agree the both referees' comments that the manuscript provided valuable data-sets with higher spatial resolution and greater number of validations using ground-truth data than many of previous studies. The authors responded to the most of the reviewers comments appropriately and added sufficient information such as canopy height assessment to describe the performance of the data-sets better. I would recommend publication of the manuscript after some minor corrections and improvements as follows.

Rs: Thanks for your suggestions. After a careful checking the NDVI-based equation for short-canopy height (reviewer # 2 has pointed out the linear equation may not be appropriate), we found that the canopy height for low-NDVI area has been over-estimated by this method, so it is adjusted. The updated method gives more reasonable estimate of canopy height. Please compare Fig. 1 and Fig.2.

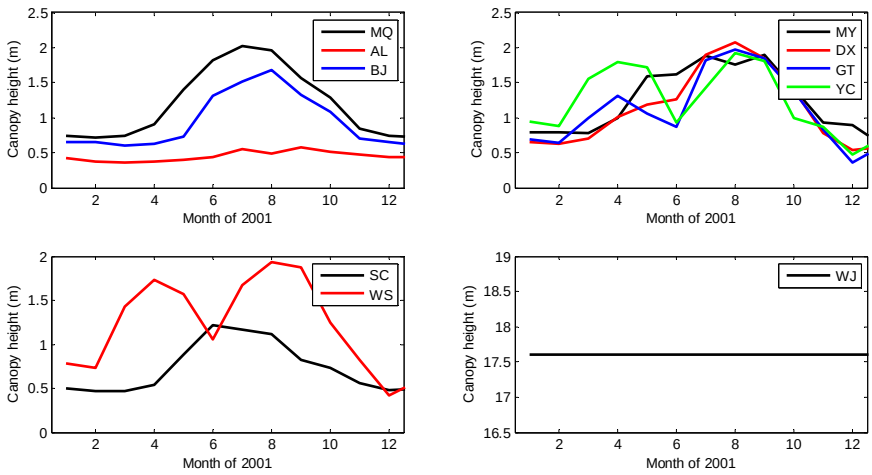

Fig. 1 Canopy height calculated by $HC = HC_{min} + \frac{HC_{max} - HC_{min}}{(NDVI_{max}(x,y) - NDVI_{min}(x,y))} \times (NDVI(x,y) - NDVI_{min}(x,y))$,

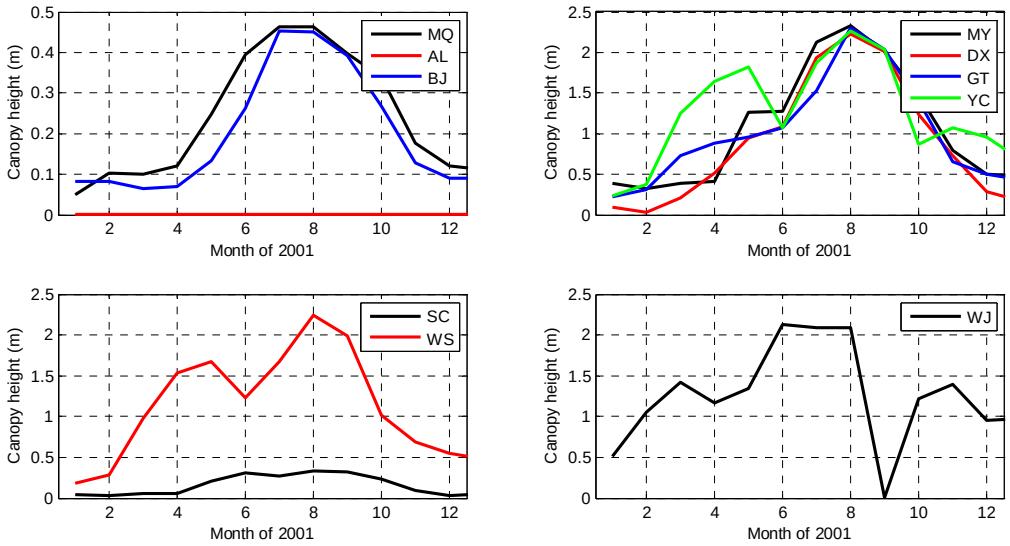

Fig. 2 Canopy height calculated by $HC(LCT) = HC_{min}(LCT) + \frac{HC_{max}(LCT) - HC_{min}(LCT)}{(NDVI_{max}(LCT) - NDVI_{min}(LCT))} \times (NDVI(LCT) - NDVI_{min}(LCT))$ *,*

The paragraph about the short-canopy height calculation was revised, below is the new version. We have kept the track changes in the manuscript.

we calculated short-canopy height using an enhancement of the NDVI-based equation from Chen et al. (2013b):

$$HC(LCT) = HC_{min}(LCT) + \frac{HC_{max}(LCT) - HC_{min}(LCT)}{(NDVI_{max}(LCT) - NDVI_{min}(LCT))} \times (NDVI(LCT) - NDVI_{min}(LCT)) \quad (8)$$

where $HC_{max}(LCT)$ *and* $HC_{min}(LCT)$ *are the maximum and minimum short-canopy height for a specific land cover type (LCT);* $HC_{min}(LCT)$ *is set to 0.002 m (Chen et al., 2013b); and* HC_{max} *is set to 5 m, 2.5 m, 0.5 m, 0.5 m, and 0.5 m for savannas (including woody savannas), cropland, grassland, shrubland, barren and sparsely vegetated pixels respectively. MCD12C1 land cover*

type 1 in the year of 2002 is used to classify the pixels into savannas, cropland, grassland, shrubland, barren and sparsely vegetated. $NDVI_{min}$ *and* $NDVI_{max}$ *are minimum and maximum NDVI values during our 10-year study period. Each short-canopy pixel was given an* $NDVI_{min}$ *and* $NDVI_{max}$ *value to calculate the short-canopy height.*

We found a mistake about equation 9. It has been corrected in the new version. Please see the new manuscript.

The discussion was improved by adding some original interpretations in several paragraphs according to the referees' suggestions, for example, they showed their hypotheses tested in this paper clearer. These additions improved the discussions, however, one thing that I still regret was that the descriptions for rising such scientific questions in the introduction section were still weak. Please try to emphasize the scientific questions in the introduction a little more. It would help showing the construction of this manuscript clearer, such that the introduction raised scientific issues and hypotheses and the discussion answered them or gave suggestions for future studies.

Rs: Thanks for your comments. We have added the sentence to 'Is it possible to use all available satellite observed land surface variables directly to calculate a high resolution land surface fluxes for China landmass, due to the reanalysis data has a coarse spatial resolution and contain large uncertainty?' to raise the scientific question in the introduction.

Fig. 1: Please describe the unit for the color bar.

Rs: 'The unit of the colorbar is m.' was added in the figure caption.

The last sentence of the acknowledgements may not be necessary since the authors should have worked for the data acquisition by themselves.

Rs: The sentence 'Special thanks to the edtor, Dr. Nobuko Saigusa, for her kind help during the collection of Chinaflux network dataset.' was revised to 'Special thanks to the edtor, Dr. Nobuko Saigusa'