

## Responses to the comments from editor

Dear editor,

We have received the comments on our manuscript entitled “Soil organic carbon in the Sanjiang Plain of China: storage, distribution and controlling factors” (bgd-11-14765-2014). We are very grateful for having the opportunity to revise our paper. We like to thank you for your constructive comments and advices, which have improved the quality of this manuscript. We have tried our best to address these comments. Our responses to the editor’s comments are attached. We hope you would be satisfied with the revised manuscript.

If you have any questions about this paper, please feel free to contact us.

**Comment** “Your manuscript on soil carbon storage in the Sanjiang Plain of China received enough number of comments and I examined your replies and revisions. You made appropriate responses to most comments. However, I thought that you did not reply adequately to the Comment23 from anonymous referee 3, i.e. CH<sub>4</sub> emission as a result of land-use conversion from dry farmlands to paddy fields. Please add more explanations as carefully as suggested by the referee. Additionally, in your manuscript, you used the word "ecosystems" to represent "land-cover types" (e.g., Table 1). I think the latter is more appropriate to indicate both natural biomes and croplands. Anyway, these revisions may not be difficult, and I'm looking forward to receiving your revised manuscript soon.”

**Response:** Thanks for the positive comment. First, we agree and add more explanations to make a better and accurate statement about comment 23. The third paragraph in section 4.5 was revised as: “This study find that, paddy field has a larger SOC content than dry farmland, which can be explained by greater dry matter production of paddy field (Pan et al., 2003; Xu et al., 2007; Wang et al., 2008). For the study region, in the past two decades, large area of dry farmlands have been transformed into paddy fields, motivated by governmental policy for increasing grain production and stimulated by the fact that rice growing can yield more income than planting upland crops (Song et al., 2012). Paddy field not only store more carbon in soils, but also can sequester more carbon in the atmosphere than dry farmland. In the Sanjiang Plain, dry farmland was observed to have a net CO<sub>2</sub> emissions of ~47.1 gC m<sup>-2</sup> yr<sup>-1</sup> and a net CH<sub>4</sub> absorption of ~0.2 gC m<sup>-2</sup> yr<sup>-1</sup>, while paddy field has a net CO<sub>2</sub> uptake of ~255 gC m<sup>-2</sup> yr<sup>-1</sup> and a net CH<sub>4</sub> emissions of ~7.5 gC m<sup>-2</sup> yr<sup>-1</sup> (Song et al., 2006; Wang et al., 2008; Song et al., 2009; Huang et al., 2010). Thus, conversion from dry farmland into paddy field means a transformation of carbon source to carbon sequestration, considering that the global warming potential of CH<sub>4</sub> is 23 times that of CO<sub>2</sub> (IPCC, 2001), which could foster the local carbon accumulation and mitigate climate change (Ouyang et al., 2014).”. And, all the cited publications were added to the section of “References”.

Second, we agree the comment that “land-cover types” is more appropriate to indicate both natural biomes and croplands. Therefore, we replaced the “ecosystems” with “land-cover types” in our text including the table and figure.

Third, we made some changes in the section of “Acknowledgements”. Detailed information can be found in the revised manuscript.

All the changes were marked in a version of revised manuscript.