We thank reviewer #1 for reviewing our manuscript. We have responded to each comment below. The line numbers refer to the lines in the original manuscript.

1. Ensure the conclusions are not flawed, by recalculating SOC stocks by equivalent soil mass, which is common practice;

Response:

We do not agree with reviewer 1 that for this study, comparisons of SOC stocks between land-use types should be based on equivalent soil mass. It is important to differentiate between studies that look at the impact of land-use changes and studies that report on spatial variability in SOC stocks and its underlying controlling factors. In the first type of studies, comparisons between the land-use types should be based on equivalent soil mass and hence at the start the study must consider the immediate reference land use prior to the present land uses being investigated. The reason for this is that land-use change often coincides with change in soil bulk density as a result of management practices, which may cause compaction or loosening of the soil. In such studies, comparison of SOC stocks due to land-use change must be based on equivalent soil mass to avoid interference of altered bulk density on SOC stock changes. However, in the second type of studies, where our present study belongs to, it is not necessary to base comparisons between land-use types on equal soil mass. Since, our objective in <u>not</u> about land-use change effects on SOC stocks. We aimed to quantify the spatial variability of the actual SOC stocks and its controlling factors from subplot, plot to landscape scales. Calculating SOC stocks to an equal reference mass could possibly even lead to inaccurate results as the spatial variability in soil mass contributes to the spatial variability in SOC stocks. Moreover, we have sampled the entire soil profile down to 1.2 m and no significant amounts of carbon are expected below the lowest sampling depth, meaning that the biggest impacts of any differences in soil mass between the land-use types might have been accounted for within the soil profile (VandenBygaart and Angers, 2006).

2. Show the sampling design (plots) on a map;

Response:

Reviewer 2 had also suggested that we include a map with the sampling design. We added a figure (Fig. 1) to the manuscript that will include: (1) the location of the study area in China, (2) the location of the sampling plots in the study area, and (3) a sketch of the one-ha sampling plot with the nine circular subplots arranged on a 50x50-m grid.

3. Better consider the impact of soil type (with discussion on its correlations with topography and land use) on SOCc and SOCs. Test of variance could for instance be added to Table 4.

Response:

Classification of a "soil type" is based on a range of quantitative soil properties. For instance ECEC, which is an important indicator of the presence of low or high activity clays and a key determinant parameter for soil group classification (IUSS Working Group WRB, 2014). According to the World Reference Base (IUSS Working Group WRB, 2014), soils with low activity clays like Acrisols and Ferralsols should have a subsoil CEC < 24 cmolc kg^{-1} clay whereas Cambisols and Umbrisol have a subsoil CEC > 24 cmolc kg^{-1} clay. Therefore, instead of including "soil type" as a categorical factor in the linear mixed effect models we choose to test for the impact of the relevant quantitative soil properties on SOC, like silt-plus-clay percentage and ECEC of the subsoil. These soil properties have been included as explanatory factors in the full linear mixed effect models. So, with our statistical analysis we actually considered the influence of soil type on SOC by including the quantitative soil properties "silt+clay" and ECEC and, because these are quantitative values rather than categorical variable as soil type, we are also able to quantify their influence on SOC. However, the included soil properties did not appear to have a statistically significant impact on SOC (Table 4). We also tested the impact of topography and land use on SOC, by including these factors as explanatory factors in the full linear mixed effects models.

Reviewer comment: Finally, the abstract structure is skewed to me with half of its length on methods. I would suggest the following to be considered: Abstract A. Topic sentence (s) on the subject (its importance) and research question(s): what is(are) the research gaps in this field of research? B. Objectives of the study C. Materials and methods used in the study D. Main results (with quantitative information, tests of significance) E. Conclusions: how these results respond to the objectives; general implications of the research

Response:

We agree with reviewer 1 that the quality of the abstract can be improved. We have revised the abstract by shortening the method section and following what the reviewer have outlined as the flow of the abstract. Furthermore, we provided the P values in the result's part of the abstract. We thoroughly checked that our revised abstract followed the structure described by reviewer 1.

References:

IUSS Working Group WRB: World reference base for soil resources 2014. International soil classification system for naming soils and creating legends for soil maps., 2014.

VandenBygaart, A. J. and Angers, D. A.: Towards accurate measurements of soil organic carbon stock change in agroecosystems, Can. J. Soil Sci., 86(November 2015), 465–471, doi:10.4141/S05-106, 2006.