

Interactive comment on “Do climate factors govern soil microbial community composition and biomass at a regional scale?” by L. Ma et al.

Anonymous Referee #1

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GENERAL COMMENTS This manuscript “Do climate factors govern soil microbial community composition and biomass at a regional scale?” provides us useful information to better understand the microorganism dynamics in response to the global environmental factors at large scale in north-east China. The subject fits in the general scope of Biogeosciences. The manuscript is well written and easy to follow. The context provided was reasonable, that the experimental design is sound with a suitable statistical approach. However, the Results and Discussion sections can be strengthened to have the data better presented and possible mechanisms better interpreted. I’ve made some suggestions for improvement below.

Abstract The logics of the first sentences are not good, your objectives are to quantify how environmental factors affect soil microbial communities. Suggest the first sentence

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read as “Global environmental factors impact soil microbial communities, and further affect organic matter decomposition, nutrient cycling and vegetation dynamic.” Lines 14–17: Suggest change these sentences as “Higher contributions of gram-positive bacteria were found in wetter soils, whereas higher contributions of gram-negative bacteria and fungi in drier soils. The contributions of gram-negative bacteria and fungi were lower in heavily disturbed soils than historically disturbed and undisturbed soils.” Please edit other similar sentences in this manuscript.

Introduction Page 17730, Line 24: add “regulating ” after role in Page 17732, Lines 3–4: suggest read as “At regional scales, land use change is the major reason for spatial heterogeneity.” The logics and structures of the first three paragraphs are very well. But at the last paragraph, the topic sentence at the beginning is not following the above paragraph well. Please re-organize this paragraph.

Materials and methods This section is well written, except a few minor errors: Page 17733, Line 3: add space before “44o36’ N;” Page 17733, Line 18: change “deep decrease” into “large decrease”

Results Page 17737, Lines 3–5: Change this sentence as “The first axis of CA ordination explained 27.5% of the variation in microbial community composition, mainly related to soil water gradients and management intensity (Fig. 2a and b).” Pleases also edit other similar sentences, I won’t edit all of them. “3.4 Soil microbial biomass and contributions of microbial group” section is too long, although the description is clear. Some of the first three paragraphs overlap, please shorten these parts, and focus on your main points.

Discussion At the beginning, authors start your results directly. This is good structure in scientific paper. But I’d like authors to compare your general finding with previous studies to highlight your novel results. Suggest re-write the first paragraph. In the second paragraph, the first sentence is a repeat of your results. Please summarize this result as “Soil water availability is a main control on, whichin our study

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(Fig. 5; Table 2) ". Please also correct and summarize your findings in other context in Discussion to avoid repeats of your results.

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