

## ***Interactive comment on “Carbon and nitrogen stocks in particle-size fractions of topsoil along a 3000 km aridity gradient in northern China” by X. G. Wang et al.***

**X. G. Wang et al.**

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Thank you for your comments on our manuscript entitled ‘Carbon and nitrogen stocks in particle-size fractions of topsoil along a 3000 km aridity gradient in northern China’. We found the reviews are very useful, and we hope you will agree that our revised manuscript is substantially improved. Please find below our specific revisions in response to each comment.

Comments to the Author

The manuscript entitled "Carbon and nitrogen stocks in particle-size fractions of topsoil along a 3000 km aridity gradient in northern China" examined the distribution of total

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C and N in bulk soil and different soil particle-size fractions along a 3000 km transect in arid and semi-arid grasslands of northern China, in order to relate the distribution of total C and N in bulk soil and their fractions with aridity and soil C and N stocks. The study is interesting and fits well the scope of the journal. The study deepened the understanding of the variations in content of soil particle-size fractions and their C and N concentrations with increasing aridity. Generally, the manuscript is well-structured and basically written in a concise style. And the results and conclusion is believable. However, some minor revisions should be made before publication in the journal. The article is well written with good English and needs only some adjustments and clarifications to be acceptable for publication in Biogeosciences. In addition, I think that deleting less-important data in the results will improve the manuscript.

Specific comments:

1. Abstract, L18, change "whether such changes result from" to "whether such changes are resulted from". Response: Thank you for your positive comments. Changed as suggested (Line 16).
2. Introduction, L42, carbon (C); L46, nitrogen (N). Response: Changed as suggested (Line 40, 45)
3. L48, extreme precipitation events. Response: Changed as suggested (Line 47)
4. L50, replace "Greater" with "Better". Response: Changed as suggested (Line 49)
5. L71, change "so" to "and thus". Response: Changed as suggested (Line 84)
6. L80. move the first paragraph to L62, before "Previous studies...". Response: Thank you for your suggestion. Changed as suggested (Line 62-72)
7. L94, the description of the selected transect should be move to the Study sites section. Response: Thank you for your suggestion. We moved these descriptions to the study sites section. Please see lines 112-113.

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8. Materials and methods: Since bulk density is an important factor to affect the calculated values of C or N stocks, the sampling methods should be provided in details. For example, how many cores were samples for each site? The methods of C or N stocks calculation should be described somewhere. Response: Thank you for your suggestion. Changed as suggested, please see line 140 and lines 164-175.

9. L140, The removal of visible debris should be performed immediately after sampling. As its hard to remove residues, especially roots, after the soils samples were air dried. Response: We agree with your advice. In fact, most of the visible debris was removed after sampling. But when we put the soils in deionized water, there were remain some floating debris and we also removed them. We now explain this in the description. Please see lines 146-147.

10. Results: L181, Soil C concentration; L182, N concentration. Response: Changed as suggested (Lines 199, 200)

11. L186, ( $36.06 \pm 1.49$  g C kg<sup>-1</sup> and  $3.90 \pm 0.17$  g N kg<sup>-1</sup>, respectively); ( $5.19 \pm 0.56$  g C kg<sup>-1</sup> and  $0.37 \pm 0.04$  g N kg<sup>-1</sup>, respectively). Response: Changed as suggested (Lines 204-206)

12. From L210 to L220, Please consider that whether this section can be listed in a table, which would be much clearer. Response: Thank you for your suggestion. We listed the data of this section in two tables (please see table 3, 4; Line 230 and 235).

13. Discussion: L236, which could further. Response: We deleted this sentence and discussed this in Lines 290-294.

14. L239, "was" should be changed to "were". Response: Changed as suggested (Line 256)

15. L288, change "looking at" to "considering". Response: Changed as suggested (Line 313)

16. L301, aridity gradient were resulted. Response: Changed as suggested (Line 325)

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Many thanks for your constructive comments and suggestions, which have greatly helped us to improve this manuscript.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/bg-2015-651/bg-2015-651-AC2-supplement.pdf>

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Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2015-651, 2016.

**BGD**

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