

## ***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.***

**Anonymous Referee #2**

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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 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

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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"; 2. Introduction, L42, carbon (C); L46, nitrogen (N); 3. L48, extreme precipitation events; 4. L50, replace "Greater" with "Better"; 5. L71, change "so" to "and thus"; 6. L80. move the first paragraph to L62, before "Previous studies..."; 7. L94, the description of the selected transect should be move to the Study sites section. 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. 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. 10. Results: L181, Soil C concentration; L182, N concentration; 11. L186,  $(36.06 \pm 1.49 \text{ g C kg}^{-1}$  and  $3.90 \pm 0.17 \text{ g N kg}^{-1}$ , respectively);  $(5.19 \pm 0.56 \text{ g C kg}^{-1}$  and  $0.37 \pm 0.04 \text{ g N kg}^{-1}$ , respectively); 12. From L210 to L220, Please consider that whether this section can be listed in a table, which would be much clearer. 13. Discussion: L236, which could further; 14. L239, "was" should be changed to "were"; 15. L288, change "looking at" to "considering"; 16. L301, aridity gradient were resulted.

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