

Interactive comment on “Ecohydrological effectiveness of litter crusts in sandy ecosystem” by Yu Liu et al.

Yu Liu et al.

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Received and published: 26 January 2019

Dear Referee,

Thank you for reviewing the manuscript and providing your short comments. We are glad to response all the comments, which would help to improve the message and the quality of our manuscript. The following is point-to-point responses to your comments.

Overall assessment – It would seem as though the methods used are sound as are the results obtained and the conclusions obtained from those results. However, the manuscript does require an English language edit. Some of the sentences are not comprehensible and as such it is very difficult to understand key aspects of this manuscript. I fond it very difficult to understand what the authors meant but litter crusts as it is de-

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fined in some ways as a litter layer (leaves and other plant material on the ground) while at other times it seems that the leaves and other plant material formed a crust that is somehow adhered to the surface as a mat of vegetative material. As mentioned, a detailed re-write of this manuscript is required after which I would be glad to add further comment. As a start, I would suggest that the authors begin by addressing the following:

Response: Thanks for your suggestion, our manuscript have been edited by an English Language editing service for language check. Please see the certification at the Supplement information.

Line 25 – the word “dangerous here seems too dramatic. Please consider changing.

Response: Thanks for your suggestion, we have changed “dangerous” to “serious”.

Line 26 – “human” should be “humans” Line 25-26 – Overall this sentence is a little awkward. Please consider revising.

Response: Thanks for your suggestion, we have changed “human” to “humans” and have revised the sentence as “Desertification is one of the most serious and threatening environmental problems to humans in many areas of the world, and it leads to degradation of ecosystem functions and services”.

Line 30 – Remove the word “the” before nutrients

Response: Thanks for your suggestion, we have deleted the word “the” in the sentence.

Line 32 – Are “flow dunes” an actual type of dune? Please elaborate.

Response: Thanks for your suggestion, it should be “mobile dunes”, not “flow dunes”, and we have revised the phrase as “mobile dunes”.

Line 34-35– Remove this last sentence and simply put in your own words and reference Geist and Lambin.

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Response: Thanks for your suggestion, we have revised the sentence as “Therefore, desertification is “one of the most threatening environmental problems in current society” (Geist & Lambin, 2004).”

Line 36-37 – I am not clear what is being stated here? Prevention and rehabilitation are being measured and if so how is that “applied continuously”? This is an awkward sentence.

Response: Thanks for your suggestion, we have revised the sentence as “With the increasing harm of desertification, many measurements have been implemented to prevent and combat desertification”.

Line 37-40 – I have no idea what straw checkerboards are. Please provide a description.

Response: Thanks for your suggestion, the straw checkerboard is to set straw on the surface of sand dunes forming a mesh structure. The straw checkerboard harrier is an innovative feature in China’s long history of anti-desertification. It has been extensively studied and demonstrated to be a simple, feasible, and effective mechanical sand control measure. A specific introduction to the straw checkerboard can be found on the website: <http://spd.cern.ac.cn/content?id=42752>.

Line 44 – Please specialize what “groups” biocrusts belong to.

Response: Thanks for your suggestion, we have revised the sentence as “Biocrusts are highly specialized soil-surface plant-soil complex groups that are an important component of desert ecosystems, especially in arid and semiarid regions.”

Line 50 – 51. “Deciduous trees: :” This sentence needs a reference.

Response: Thanks for your suggestion, we have added a reference here “(Liu et al., 2018)”.

Line54 “ the phrase “are of care” does not make sense.

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Response: Thanks for your suggestion, we have revised the sentence as “The interactions between precipitation, vegetation and litter crust are hot issues for hydrologists (Dunkerley, 2015)”.

Line 54 – Do the authors mean “litter layer” instead of litter crust?

Response: Thanks for your suggestion, it is litter crust in the sentence.

Line 56-59 – I fail to see how interception and storage are transport processes? Please reword this sentence.

Response: Thanks for your suggestion, we have revised the sentence as “Previous studies have explored the interception of rainfall, the water-holding capacity (WHC) of litter materials, and the degree of retention within the litter (Makkonen et al., 2013; Dunkerley, 2015; Acharya et al., 2016).”

Line 63 – No need for a comma after reference.

Response: Thanks for your suggestion, we have deleted the comma after reference.

Line 66-67 – This sentence does not make sense – please consider rewording. I think the main issue is the words “which through two basic mechanisms.

Response: Thanks for your suggestion, we have revised the sentence as “On the other hand, litter crusts affect hydrological processes by serving as a barrier that prevents precipitation from directly reaching the soil and controls soil evaporation (Bulcock and Jewitt, 2012; Van Stan et al., 2017), attenuating both directions of ground radiation flux, and by increasing resistance to water flux from the ground (Juancamilo et al., 2010)”.

Line 73-74. This sentence needs to be reworded or removed.

Response: Thanks for your suggestion, we have deleted the sentence.

Line 74-75 “The grain for Green Project: : :.” This sentence needs a reference.

Response: Thanks for your suggestion, we have added a reference “(Chen et al.,

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2015)” for the sentence.

Line 75 - What is E.g? If this is supposed to be “For example” then write “for example”

Response: Thanks for your suggestion, we have deleted “E.g.”.

Line 78: What kind of crusts? I am confused if we are talking about bio crusts or litter crusts.

Response: Thanks for your suggestion, the increase of the vegetation has the benefit of both the development of litter crust and biocrust. Therefore, we have revised the sentence as “the environmental conditions have improved and are suitable for the development and growth of biocrusts and litter crusts in the arid areas”.

Line 86: I am sorry, but I am very confused. If this manuscript is only about litter layers, why does the introduction speak about biocrusts, which are not the same as litter layers.

Response: Thanks for your suggestion, litter crust is a new concept, and we introduced the more familiar biocrusts to make a comparison.

Line 91: I am not familiar with what a water-wind erosion crisscross section is. Please explain.

Response: Thanks for your suggestion, erosion zones in China are divided into water erosion, wind erosion and freeze-thaw erosion according to their erosive force. The erosion area containing the two phases of water erosion and wind erosion is called the water-erosion and wind-erosion cross-zone.

Line 93 – 94 – Please write “monthly temperature” instead of just “temperature”

Response: Thanks for your suggestion, we have revised following the suggestion.

Line 98 – Please state percentages to the nearest 10th of a percent. These values are in no way significant figures.

Response: Thanks for your suggestion, we have revised the figures to keep one decimal place.

Line 99: Do the authors mean “erosion resistance” instead of “corrosion resistance”?

Response: Thanks for your suggestion, it should be “erosion resistance” here, and we have revised.

Line 102: I do not think the authors mean “removable” sand dunes. Please change.

Response: Thanks for your suggestion, we have changed “removable sand dunes” to “mobile sand dunes” in the sentence.

Line 109: I do not think *Populus* can prevent wind. Please reword to reduce wind speed at the surface or some other phrase.

Response: Thanks for your suggestion, we have revised the sentence to “*Populus simonii* was chosen as the main species for reduce wind speed at surface.”

Line 112: Litters would not be the appropriate term here. Change to Litter layers.

Response: Thanks for your suggestion, we have revised the term as suggested.

Line 114-116 –There is a serious issue with what the authors mean by litter crusts – as described in the introduction they were speaking of litter layers, and in the introduction biocrusts were references considerably. How the authors define litter crusts here is completely different. This issue really needs to be addressed as there is no way for the reader to actually know what is being studied.

Response: Thanks for your suggestion, we have given a specific introduction to the litter crusts in the Introduction. “Unlike the common litter layer, litter crust is a hard shell formed by mixing litter and sand under external forces such as rain or wind. In this study, litter crust was defined as the crust formed by “all dead organic material made of both decomposed and undecomposed plant parts which are not incorporated into the mineral soil beneath” (Acharya et al., 2016)”.

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Line 122: replace “was” with “were” Line 127-128: So mosses are biocrusts? Again, very, very confused.

Response: Thanks for your suggestion, we have revised the sentence. Biocrust is an important surface-covered type in the desert. It is mainly divided into three types of algae, lichens and mosses.

Line 131: All samples were collected at the same moment? Really? I do not understand how this could be accomplished. Within the same 10-minute time period, same hour, maybe, but the same moment (ie, second)?c

Response: Thanks for your suggestion, sorry for inaccurate use of phrase. We have revised the sentence as “Ten samples were collected for analysis in each sample site and all samples collected”.

Line 161-“: :while avoiding produce leakage passages: :”This part of the sentences does not make sense.

Response: Thanks for your suggestion, we have deleted the sentence.

Lines 199, 201,214, 215, etc –Please report numbers and percentages to the nearest decimal point.

Response: Thanks for your suggestion, we have kept one decimal place throughout the manuscript.

Line 240: Please reference some or all of the “few studies”

Response: Thanks for your suggestion, we have added the reference “(Jia et al., 2018)” in the sentence.

Line 245 – Remove comma after “ground”

Response: Thanks for your suggestion, we have deleted the comma after “ground”.

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Please also note the supplement to this comment:

<https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-579/hess-2018-579-AC5-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2018-579>, 2018.

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