

Interactive comment on “The Interactions Between Precipitation, Vegetation and Dust Emission Over Semi-Arid Mongolia” by Yuki Sofue et al.

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To Reviewer#3 We appreciate your very appropriate comment. First I'd like to answer your comment easily. Also, as you pointed out, I'd like to increase our data and make a corrections new version as soon as possible.

Reviewer's comment 1. There are few materials or data to be used to analyze the relationship between the precipitation and dust emission, and vegetation and dust emission, except for a single regression analysis “between summer vegetation and number of days in which dust storms occurred in the next spring in Sainshand city shown in Fig. 7a, b”, although it is hard to be understand that the relationship was significant with such a low correlation coefficient, $R^2 = 0.22$. Authors answer: 1. The World Me-

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eteorological Observation Data (WMOD) that we used for this analysis included only 8 stations in our study area. Therefore, we extracted the data observed at Sainshand station as an example. However we can add at least seven results from analysis between NDVI and meteorological data observed at other seven stations.

Reviewer's comment 2. Furthermore, it is also hard to be understand the conclusion that “maintaining vegetation coverage during this period could reduce dust storm occurrence in the next spring” with the current single regression analysis with the data of only one site. Authors answer:

2. Vegetation in the semi-arid region is dominated by annual and perennial plants. Annual plants are highly dependent on rainfall and are also susceptible to overgrazing, while, perennial plants are relatively stable and can survive even in extreme drought conditions. However, once perennial plants such as shrub's die, they need a very long time to recover. For example, roots of many herbaceous plants can only extend 10 cm, they are very sensitive and response to rainfall but annual herbaceous plants are eaten by livestock, blown by the wind and lose until the following spring, so it's do not significantly affect the frequency of dust storms. Suaeda aralocaspica is a monoecious annual species commonly found in the Gobi desert and many perennial plants found in this region, especially shrubs are typified as Haloxylon ammodendron. However, annual plants do not influence so much for dust storm frequencies. On the other hands, perennial plants have very deep roots and this vegetation spots are effective in extracting water from their bare surroundings and therefore survive (Hardenberg et al., 2001), so they would not be affected by all precipitation. However, they can survive through winter to next spring and effect to frequency of outbreak of dust storm.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/acp-2017-83/acp-2017-83-AC3-supplement.pdf>

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