



Inter-annual variation of threshold wind speed for dust emission in Mongolia

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Threshold wind speed for dust emission, which is the minimum wind speed required to lift dust particles into the atmosphere, largely varies according to land-cover and land-use changes (LCLUC) (e.g., soil wetness, vegetation cover, snow cover, soil freeze, cultivation, grazing). This means that we can recognize the variation of threshold speed as an index of LCLUC. Moreover, well recognition of the relation between LCLUC and variations of threshold speed contributes improvements of numerical dust models, which have been utilized for the evaluation of the impact of aeolian dust on climate.

The threshold speed has been parameterized on the basis of laboratory experiments using wind tunnels and in-situ observations. These experiments have a very big advantage in the direct measurement of threshold speed. However, a disadvantage is that laboratory experiments can be carried out only in ideal conditions and in-situ observations can be done in finite places and periods, although land surface conditions exhibit great spatial and temporal variabilities that cannot be covered by such experiments.

This study will present inter-annual variations of threshold speed in Mongolia, where considerable inter-annual LCLUC has been reported due to climatic change such as drought and rapid temperature growth by global warming and human activities such as overgrazing. We estimated threshold speeds by the statistical method in Kurosaki and Mikami (2007) using synoptic meteorological data. So far we obtained a result that threshold speeds on April have gradually declined from 1970s to 2000s in southern Mongolia. We will discuss these variations with LCLUC.

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