

Up-scaling field scale wind erosion models to regional scale

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ABSTRACT

Wind erosion is a regional scale problem, which affects large areas in the arid and semi-arid regions in our planet. The majority of current wind erosion models are applicable at the plot, field or village scales, or focus on suspension transport at the regional scale. The objective of this research is to upscale a validated and calibrated field scale model to a regional scale to provide insight on the wind erosion process in general and particular saltation mode at the regional scale.

Regional scale input data of land cover, soil properties, and soil roughness were derived through analyses of satellite images of the region taken at the wind erosion season. And these data was validated against field data collected during the wind erosion season in 2009 and 2010. Meteorological input data were obtained by the analyses of long terms recorded data at several climate stations in the region. The calibrated and validated field scale model, the Revised Wind Erosion Equation (RWEQ) was adjusted to make the model applicable at the regional scale (20 x 20 km). Special attention was given to the interrelation between neighbouring land units.

The results of this research show that regional scale wind erosion model that focus on saltation can provide insight on the wind erosion at a regional scale. The validation of the model against ground data collected by portable plot strategy shows that the model gave acceptable results taking into account the large area and the diversity of land uses in the region.

Keywords: Wind erosion, Saltation, regional scale, RWEQ