

# Sensitivity of Aeolian Modelling to Soil Particle Size Data

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The simulation of size-dependent sand transport and dust emission requires particle size distributions (PSDs) of parent soil as input data. However, soil PSDs are difficult to measure and different sample pre-treatment and measurement techniques can give different results which may significantly affect the model estimates of sand/dust fluxes. In large-scale (regional to global) dust models (e.g. GCMs), soils are usually classified according to their hydraulic properties and this classification is not necessarily consistent with soil classifications based on PSD. Over the Australian continent, 29 soil samples have been collected and their PSDs analyzed at high resolution (256 size classes) by Coulter Multisizer. It is found that samples for a given USDA soil texture class (e.g. loam), can have profoundly different PSDs. This suggests that a new soil type classification dedicated for wind-erosion modeling is needed; which reflects the natural particle and aggregate size condition of soils. In this study, we use a wind erosion model to test how uncertainties in PSDs affect the model performance. The range of uncertainties in sand and dust fluxes arising from particle-size uncertainties is quantified.