Particle-size characteristics of the vertical dust profiles of two contrasting dust events in the Channel Country of western Queensland, Australia.

H.J. Butler[1], G.H. McTainsh[2] and W.L. Hogarth[3]

[1] Australian Centre for Sustainable Catchments, Faculty of Sciences, University of Southern Queensland, Toowoomba, Queensland, Australia. *Also at: Centre for Riverine Landscapes, Faculty of Environmental Sciences, Griffith University, Brisbane, Queensland, 4111, Australia.*

[2] Centre for Riverine Landscapes, Faculty of Environmental Sciences, Griffith University, Brisbane, Queensland, Australia.
[3] Faculty of Science and Information Technology, University of Newcastle, Callaghan, New South Wales, 2305, Australia.

Spatial and temporal variations in vegetation and soil surface conditions of rangelands add a level of complexity to wind erosion processes which is often difficult to model or measure. Butler and colleagues have developed a methodology which combines computer simulation and experimental measurement to analyse how spatial and temporal changes in dust source area emission rates and atmospheric conditions affect vertical dust concentration profiles during wind erosion events in the Queensland Channel Country. This methodology has not, however, taken into account how variations in dust source area particle-size can affect vertical dust concentration profiles.

The present paper examines how the particle-size characteristics of dust source soils affect both vertical dust concentration profiles and the vertical distribution of particle-sizes in two contrasting wind erosion events in the Queensland Channel Country. Comparisons are made between computer simulations of these events and the results of field measurements (of vertical dust concentration profiles) and laboratory measurements (of dust particle-size). Computer simulations of the particle-size emissions from the different dust source areas during the two events produce vertical distributions of dust particle-sizes which are similar to the measured dust particle-sizes for these events. These results indicate that erodibility-induced spatial and temporal variations in particle-size emissions of dust source areas have important influences upon: dust fluxes, vertical dust concentration profiles and the vertical distribution of dust particle-sizes within these profiles