



Geomorphic thresholds: aeolian dune activity under a changing vegetation cover in the Southwest Kalahari

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Partially vegetated dunes have been viewed as relicts from a drier and/or windier past. However, research in the southwest Kalahari (e.g. Wiggs et al, 1995; Bullard et al, 1996) confirmed our understanding that sediment movement can occur under vegetation canopies and that dune morphology is tied to the dynamics of vegetation, showing a staggered and/or damped response to a changing climatic, grazing or burning regime. Evidence suggested that dunes which are stripped of vegetation through natural or human disturbance exhibit an order of magnitude increase in surface sediment activity and a lateral vegetation cover below which dune activity was markedly increased was recognised at about 14%. Questions remain as to the rapidity of recovery of vegetation after such disturbances and how quickly the regulatory effect of vegetation cover on dune dynamics can be re-established. This paper reports findings of a 13-year programme monitoring dune activity under a re-establishing vegetation cover after a severe disturbance.

Results indicate that even in prime growing conditions it can take 8-10 years for disturbed vegetation to re-establish and regain control of dune dynamics. However, there is a contrast in recovery rate on differing landscape components with vegetation renewal in interdunes being twice as rapid as those in crestal regions. Such time-scales of change have relevance both in (i) the calibration of models of dune dynamics and environmental change with regard to future predicted climate warming and drying; and (ii) management of vegetated dune systems in semi-arid environments.