

The effect of vegetation patterns on wind-blown mass transport at the regional-scale: A wind tunnel experiment

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ABSTRACT

Re-vegetating land is a commonly used method to reduce the negative effects of wind erosion. However, there is limited knowledge on the effect of vegetation pattern on wind-blown mass transport. The objective of this research was therefore to investigate the effect of vegetation pattern on the windblown mass transport within a land unit and at the border among land units. Wind tunnel experiments were conducted with artificial shrubs representing *Atriplex halimus*. Sand translocation was measured after 200-230 seconds wind runs at speed of 11 ms⁻¹ using mm paper prepared for this purpose.

This research showed that 1) maximum transport capacity within a land unit is affected by the neighboring land units and by the vegetation pattern within both the unit itself and the neighboring land units; 2) the effect of neighboring land units includes the sheltering effect and the regulation of sediment passing from one land unit to the neighboring land units; 3) for designing re-vegetation of degraded land the “streets” (zones of erosion areas similar to streets) effect can be considered; and 4) beside investigation of the general effect of vegetation pattern on the erosion and deposition along the region, it is important to investigate the redistribution of sediment at small-scales according to the aim of the project.

Keywords: wind erosion; vegetation pattern; wind-blown mass transport; wind tunnel