

ABSTRACT

Many studies of slope form and sediment transfer dynamics use either bounded field plots or laboratory physical hardware models, to study associations between morphology and process. Results are presented here of a study which examines spatial variations in slope form, changing ground surface boulder cover between sites and at different points along slope profiles and evidence for the movement of fine-grained sediments which underlie the boulder cover. The study site is located in north-east Jordan, an arid landscape, characterised by a late Tertiary to early Quaternary basalt plateau, spreading across the foot-slopes of the Druz Mountains. Basalt age ranges from approximately 8.9 Ma to recent scoriaceous deposits from local eruptive centres, which are no more than 100 000 years old. The study considers whole slope profiles rather than a representative section of a slope and accounts for form differences by quantifying slope shape using a length : height integral. Slope form differs with basalt age, gradually changing from concave to convex shapes. The boulder cover can be used to examine the mobility and redistribution of underlying fine-grained sediment, by establishing the degree of clast burial at points along slope profiles. Twenty-five slope profiles were surveyed and five plots, distributed between crest and toe, located at similar points on thirteen. The axial dimensions of boulders within each plot were recorded. Sorting and the preferential movement of smaller clasts is a characteristic of the steepest part of slopes, while mean clast size increases down-slope for older basalts and decreases down-slope for younger basalts. The degree of wadi network evolution and the development of sediment pans, known as Qa and Marab, varies with flow age. Links can be established between the age and physical nature of individual lava flows, differences in slope form and their spatial distribution. Associations also exist between changes in boulder dimensions, basalt type and the extent of clast burial between topographic highs and lows.

KEY WORDS: Jordan, slopes, boulder cover, arid environments.