Geophysical Research Abstracts, Vol. 7, 08795, 2005
SRef-ID: 1607-7962/gra/EGU05-A-08795

Characterising the behaviour of water, sediment and nutrient fluxes from semi-arid hillslopes on intra and inter-event timescales.

R.E. Brazier(1), A.J. Parsons(2), J. Wainwright(1) and D.M. Powell(2).

(1)Department of Geography, University of Sheffield, Winter St, Sheffield, S10 2TN, UK, (2) Department of Geography, University of Leicester, University Rd, Leicester, LE1 7RH, UK (richard.brazier@shef.ac.uk / Tel: +44 (0)114 222 7946 / Fax: +44 (0)114 222 7912)

A suite of hillslope scale monitoring experiments was set up to characterize the behaviour of water, sediment and nutrients (Nitrate – NO_3-N and Ammonium – NH_4-N) on interrill areas within semi-arid hillslopes in the US south-west. Observed data from these experiments were collected over a two year period encompassing thirteen, discrete, high intensity rainfall events that generated significant levels of overland flow from the hillslope plot areas.

Monitoring occurred throughout the monsoon season in order to capture the high levels of variability in fluxes that are generated from the first event of the season, with respect to those that occur later on, when vegetation cover is well developed, antecedent moisture contents may be higher and surface crusting may be more influential. Observations were made at five different scales from $21m^2$ to $1200m^2$. Results show that concentrations of sediment and nutrients are typically high for early-season events, particularly the first events of the season, though runoff coefficients may be lower. Such behaviour is attributed to the poor compaction of the soil surface after repeated diurnal cycles of temperature around 0^0c throughout the winter, as well as the presence of large amounts of organic matter associated with leaf-fall from the previous autumn.

A comparison of fluxes throughout the 2002 monsoon season is also presented, wherein a large storm with a return period of approximately 5 years was observed. The position of this large magnitude event in the midst of the season provides a good demonstration of the significance of event timing, as well as event magnitude, in pro-

ducing high rates of sediment and nutrient delivery to adjacent channels.