



Connectivity variations in time and space: role of events, structures and morphology in ephemeral channels

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Flow and sediment processes in ephemeral channels are highly dynamic and spatially variable. The connectivity characteristics in a range of events are examined for several semi-arid catchments in Southeast Spain. Rainfall thresholds for runoff generation on slopes and for flow generation in channels have been identified at various scales. In many events, flow is not continuous down the channel system due partly to localised rainfall and to transmission losses but also to structural and morphological conditions. One extreme flow event with high sediment supply produced very high flow and sediment connectivity throughout the system. Results of spatial analysis of variation in hydraulics and sediment processes are presented and the effects are analysed. Amounts and locations of sediment storage were identified from repeat surveys. The overall contribution of such an event to morphological and sedimentological changes in the channel and longer-term landscape evolution is assessed. Land use and management are demonstrated to have a profound influence on the sediment delivery and connectivity functioning. The implications for land, channel and flood management in such an environment, together with the impacts of longer-term variations in flow regime due to land use and climate change, are considered.