Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11417, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11417
EGU General Assembly 2008

Complexity in Late-Holocene accelerated alluviation: a comparison of two small catchments in the U.K.

A. Brown

School of Geography, University of Southampton, Highfields Campus, Southampton, SO17 1BJ, Tony.Brown@soton.ac.uk

The complexity of system response to environmental change can be exhibited through spatial or temporal variation and/or in internal system configuration. Studies of small-medium sized catchment alluviation in the UK over the last twenty years suggests considerable spatial variation. This paper illustrates this variation with reference to two catchments; the Frome in the West Midlands and the Culm in South West England. Headwater valleys and small river catchments (basins) are particularly sensitive to the combined effects of erosive land uses and climate change. The Frome Valley presents an extreme case of post Bronze Age alluviation due to a combination of a susceptible bedrock lithology, intensive arable cultivation and climate change. In contrast the river Culm experiences channel change and system re-organisation but insignificant overbank alluviation until the last few hundred years. The causes of such spatial variation can be related to both the differential timing and nature of both human impact and climate change and the inherent characteristics of river catchments. The paper examines these factors and suggests that we need to distinguish between the complexity of the environmental change, both climatic and human in origin, and the complexity of response. It is argued that a combination of the history of the system, inherent catchment characteristics and the coincidence of events will cause both complexity and spatial variations in geomorphic response to environmental change. Although catchments may under specific conditions show a relatively simple response at larger scales even simple responses will inevitably result in complexity. The historically conditioned nature of system response is the most problematic element in attempts to model geomorphic response to environmental change.