Geophysical Research Abstracts,
Vol. 11, EGU2009-13863, 2009
EGU General Assembly 2009

Scale considerations in modelling landscape change

K Richards
Department of Geography, University of Cambridge

It is almost a truism that geomorphology demands some combination of both process-based understanding and analysis of landscape history in relation to climate and tectonic changes. However, it still seems difficult to achieve integration across the differences in scale implied by these two different kinds of study. This paper will review why this might be.

One reason is that any observed landscape is a unique integration of the influence of multiple process regimes, and local events. Physically-based landscape models usually embody selected (and simplified) process representation to identify generic landscape changes. These are unlikely to match any sampled and observed real history. So the question arises as to what data can (should?) be used to compare model output and reality?

Another reason is that the time constants of landscape dynamics, and the averaging periods required for model parameters and for model and real-word data are all poorly constrained. Sedimentary records may be dated, but how at-a-point evidence of an aggradation relates to upstream areally-integrated sediment production processes driven by exogenous forcing remains unclear. So another question is how can these time constants be conceptualised and defined to improve the framework for relating sediment budget history to the dynamics of external forcing.

A third reason is that sediment budget studies have yet to develop a fully integrated approach to erosional history, sediment production, storage, delivery, and yield. However, there is increasing potential for linking the dating of erosion and deposition, and for using distributed models that provide just such integration.