



## **Meander cut-offs: processes, rates and characteristics of sedimentation over time**

J. M. Hooke

Department of Geography, University of Liverpool, UK (janet.hooke@liv.ac.uk)

Infills of ancient meander cut-offs and ox-bow lakes are frequently examined for their sedimentology and age. A slow and linear rate of infill is often assumed. Measurement and monitoring of the mechanisms, nature and progression of the infill of several cut-offs on gravel-bed rivers from moment of channel cut-through to complete sedimentation in the floodplain has enabled the variability over time and the sequence to be analysed. Massive gravel sedimentation is found often to take place during the actual process of cut-off. Rapid sedimentation of sand of up to half of the channel height can take place within a few years. Rate of sedimentation rapidly declines after that, with the process exhibiting a classic rate law. Assessments of rate of infill from depth and basal dates can therefore be highly misleading. Spatially, sedimentation takes place at highest rates at the upstream inlet channel and more slowly at the downstream outlet channel. Ox-bow lakes may persist for many years depending on the flood dynamics, the channel morphology and the sediment loads. A high proportion of the channel infill is shown to result from short-term rapid sedimentation. Some inferences on cut-off channels rates and ages that assume even sedimentation over long periods may therefore be in error. Channel processes rather than true overbank, floodplain processes may make a much higher contribution to floodplain construction than generally assessed.