Geophysical Research Abstracts,
Vol. 11, EGU2009-13698, 2009
EGU General Assembly 2009

Downstream patterns of bed material grain size in a large, lowland alluvial river subject to low sediment supply

M.B. Singer

University of St Andrews, School of Geography and Geosciences, School of Geography and Geosciences, North Street, KY16 9AL St Andrews, UK

Dams and other river engineering may reduce sediment supply to mainstem river channels, but there is little research on the impacts of such reductions upon bed material grain size distributions. A new data set of bimodal subaqueous channel bed sediments was analyzed for longitudinal patterns in grain size. It yielded two interesting observations: (1) separate fining trends in d50 exist for gravel and fines that overlap for $\sim$175 river kilometers, and (2) this overlap in fining trends results in a protracted (nonabrupt) gravel to sand transition. These suggest bed patchiness that is interpreted in the context of inherent grain size bimodality, localized hydraulic sorting due to spatially heterogeneous (and low) sediment supply, and local deviations in channel gradient. The data also show that tributaries have a minor impact on main stem downstream fining due to basin shape and tectonic history. In addition, subaqueous channel sediments were observed to be finer than nearby sediments collected from exposed bars, which may indicate a narrow active zone of transport where bars are disconnected from sediment movement. This research has implications for bed material collection and theories of downstream fining. The results are relevant within the context of the impact of dams on longitudinal sediment balance.