Geophysical Research Abstracts, Vol. 8, 09348, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09348

Experimental study on bars formation

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River flows are characterized by a fascinating phenomenon in which the interaction between the fluid and its container determines the shape of the latter (i.e. through flow and channel bed interactions). This interaction can be explained in terms of instability mechanisms. Under suitable conditions, flow, in a straight, flat, erodible bed channel, loses stability and tends towards a perturbed configuration characterized by disturbances over different spatial scales. Over the last few decades, a large number of studies have focused on understanding the above mechanism in order to predict conditions for the development of bed and channel forms. In particular, bars are a major large scale channel form observed in rivers, which have gained increasing importance as a result of their unexpected appearance following rivers regulation works, such as canalization and artificial straightening, motivated by land reclamation purpose. An example is the Paraná River alluvial system in Argentina, which is a typical case of an alluvial system whose geomorphological evolution, for example island formation and migration, significantly influences the activities of riverside populations. Considering bars which develop spontaneously in erodible channels as a result of the stability process (i.e. free bars), the purpose of this work has been to conduct an experimental study guide by linear stability theories, to determine bar formation processes along an initially straight channel, using a movable bed and banks flume facility available at the University of Newcastle upon Tyne (UK).