



Complexity of alluvial relief of the largest rivers.

A. SIDORCHUK

Geographical Faculty, Moscow State University, 119899, Moscow, Russia
e-mail: sidor@yas.geogr.msu.su

Alluvial relief of the largest rivers is characterized by a well-defined hierarchical structure. The full hierarchy can be observed at broad valley bottom having sandy alluvium where the confining factors of the fluvial processes are weak and Froude number for river flow is low. Therefore self-organising processes of the fluvial morphology evolution are well developed here, and complicated hierarchical structure characterizes the channel relief. The complexity of the system generally increases with the river size. Investigations on the largest Russian rivers (Lena, Ob', Enisey, Volga and others) show that highest level of this hierarchy (megaforms) is the multi-parallel-channel pattern of the main channel, usually with an anastomosed net of small flood plain distributaries. The level of macroforms is represented by channel meanders and islands. Alluvial bars of first and second-order usually belong to hierarchical level of mesoforms. The bed forms in the largest river channels (dunes and megaripples) are usually organized into microforms and ultramicroforms. Statistical characteristics of all alluvial features are similar: the length is described with a gamma distribution and the height with a Weibull distribution. Variability coefficient generally decreases with increase of hierarchical level of alluvial feature from 0.4-0.45 for megaripples to 0.20-0.35 for large bars and meanders. Despite scale-independent similarity in the channel geometry (the same meander wavelength – channel width ratios, island length - width ratios), large rivers differ from small ones by complicated internal structure of alluvial relief.

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