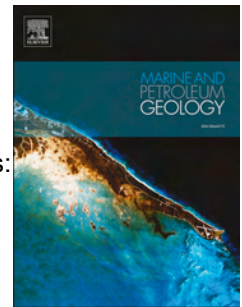


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Empirical relationship between river slope and the elongation of bars in braided rivers: a potential tool for paleoslope analysis from subsurface data

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Abstract

Paleoslope of ancient river systems is a fundamental parameter needed to reconstruct paleohydrology and paleoclimate from the fluvial sedimentary record. The shape of braid-bars in 22 modern rivers yields a relationship between average bar elongation (length/width) and river slope. Steep rivers display more elongated bars than gently dipping reaches. This relationship has potential application to ancient braided systems preserved in the subsurface and imaged by 3D seismic data. The average elongation of bars identified on a stratal-slice through the DaGang river deposits in North-East China yields a slope prediction which, combined with empirical data on grain-size and slope of alluvial rivers, predicts a median grain-size of between 0.1 and 1 mm for the considered river sediment, in agreement with grain-size data in an adjacent isochronous belt. This study provides an additional approach for paleohydraulics in sedimentary basins and grain-size prediction in exploration.

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