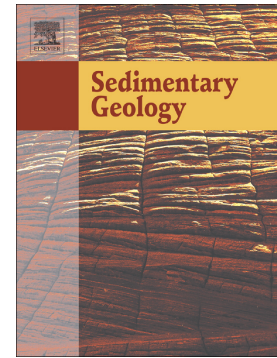


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Point bar sedimentation and erosion produced by an extreme flood in a sand and gravel-bed meandering river

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ABSTRACT

In fluvial environments, extreme floods are often catalysts for substantial geomorphologic planform change. Despite the significant sediment erosion and deposition associated with high-magnitude, low-frequency floods, their sedimentological products often lack distinctive characteristics. However, the sedimentological expression of extreme floods in sand and gravel-bed meandering rivers has yet to be fully described. The sedimentological characteristics of a 1 in 100 year flood on a point bar of the South Saskatchewan River in Alberta, Canada, are investigated. Digital elevation models from multitemporal LiDAR surveys, field sediment sampling, measured sections, shallow boreholes, and aerial photographs were used to identify regions of sediment deposition and erosion, quantify the amount of vertical elevation change, and describe the sedimentology, stratigraphy and grain-size distribution of the flood deposit. The upstream portion of the point bar was dominated by high-velocity flow and erosion. The majority of sedimentation occurred at the meander-bend apex in lee and scroll bars

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