

Episodic deposition on nearly flat, low-gradient topographic surfaces, Middle Proterozoic Belt Supergroup, Montana and Idaho, USA

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The intracratonic block fault Belt basin was filled from about 1.5 to 1.4 Ga with sediments as Rodinia assembled. Sand, silt and clay from a western land mass (present coordinates) filled the basin from the west and south. During Ravalli and Missoula group deposition, vast alluvial aprons dominated by sheetfloods stretched across the basin. Proximal facies are mostly tabular beds of flat-laminated and trough crossbedded arenite, recording upper and lower regime sheetflood flow. Decimeter-scale mudcracked graded beds and muddy lensey sandy beds mark the mid alluvial apron sand flats. Centimeter scale silt-to-clay couplets were deposited in distal playas.

During the intervening "middle Belt carbonate", subaqueous cycles with basal hummocky crossbeds fine and thin upward and landward to centimeter-scale graded couplets and millimeter-scale microlaminae. The bottom was everywhere within the reach of storm waves, which drove suspended mud from the sandy "sea" center to the muddy margins. Thus, both subaerial and subaqueous sediments were deposited on nearly flat, low-gradient topographic surfaces.