

**AAPG Annual Meeting
March 10-13, 2002
Houston, Texas**

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Anatomy of an Aggradational Braidplain

The Salt Wash Member (Morrison Formation), south-central Utah comprises braided channelbelt sandstones, crevasse splays and floodplain mudstones. The proportions of these facies tracts change as a function of stratigraphic position, reflecting variable A/S conditions. 20-50-m-thick, base-level-rise stratigraphic cycles are separated by surfaces of bypass. Trough cross stratification (TRX) (remnants of dunes in deeper anabranches) dominates in low A/S regimes near the base of channel complexes. Low-angle upper-flow-regime lamination (remnants of braid bars) mixed with TRX is common in highest A/S conditions. Floodplain mudstones with embedded braided channels and crevasse splays also occupy the highest A/S positions.

Channelbelt complexes are ~2.5km wide and ~90m thick. Vertically stacked channelbelt sandstones dominate the central axis of the complexes. Laterally continuous (at the scale of the channelbelt complexes) and discontinuous floodplain mudstones =10m thick sometimes separate channelbelt sandstones. Where present, they occur at the top of base-level-rise-asymmetrical cycles. The proportion of floodplain mudstones increases and crevasse splays appear, replacing some of the channelbelt sandstones, away from the axis of the channelbelt complexes. Sand-rich crevasse splays 1-3-m thick attest that the braidplain built an alluvial ridge. In the upper part and along the margins of the channelbelt complexes, channel sandstones shrink and become concentrated toward the axis of the complexes. At the same stratigraphic positions, floodplain mudstones and crevasse splays move closer toward the axis, replacing channel sandstones. This geometry is a consequence of reduction of discharge through the braidplain signaling gradual avulsion to a lower position on the floodplain. The up-building and aggradation of channel sandstones near the axis of the complexes is far more important in creating vertical continuity of sandstones than erosional scouring, which is limited to a maximum of 5m.