

**AAPG Annual Convention
Salt Lake City, Utah
May 11-14, 2003**

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Recognition of Systems Tracts through Changes in Fluvial Facies Architecture, Paleocene Fort Union Formation, Rock Springs Uplift, Wyoming

Exposures of the Paleocene Fort Union Formation along the Rock Springs Uplift in southwestern Wyoming provide excellent examples of the up-dip expression of base-level changes on fluvial environments, and their use as systems-tract indicators. Exposures consist of thick successions (greater than 100 m exposures) of fluvial sandstones and fine-grained overbank deposits (Facies 1). The vertical successions are punctuated by (1) thicker (up to 10 m thick), laterally extensive sandstones (Facies 2) and (2) by intervals characterized by tidal indicators (Facies 3). Fluvial sandstones of Facies 1 average less than 2 meters thick, and are dominated by small-scale trough cross beds, current and climbing ripples. Overbank deposits contain numerous beds of well-preserved leaf imprints. Intervals of the thicker sandstones (Facies 2) consist of nested channel-fill deposits, dominated by large-scale cross strata, and have been traced as a continuous unit across outcrop exposure for more than 10 kilometers. These intervals are interpreted to represent periods of base-level fall and increased stream gradient. Intervals with tidal indicators (Facies 3) contain flaser and wavy bedding, abundant mud drapes, compound cross stratification, and sigmoidal cross stratification. These intervals are interpreted to represent periods of base level rise, and the evolution of river systems into estuaries. Depositional sequences and systems tracts are recognized through the changes in facies architecture described above: Facies 1 is interpreted as HST, Facies 2 as LST, and Facies 3 as TST. Sequence boundaries correspond to the base of Facies 2 and the corresponding increase in fluvial gradient.