

Tidal Deposits of the Labette Shale and Peru Sandstone, Southwestern Rogers County, Oklahoma

Scott Schad¹, Jeanette King¹, Robert Coleman¹, Dennis Kerr¹ (1) The University of Tulsa, Tulsa, OK

A road cut north of Catoosa, Oklahoma affords a rare exposure of the otherwise heavily weathered upper Desmoinesian Labette Shale and Peru sandstone. About 20m of interstratified rippled sandstone and mudstone, and lenses of sandstone are exposed. Calibrated digital photo mosaics were assembled. Photos were processed to produce an image similar to a seismic profile.

Evidence for tidal sedimentation includes: reversing ripple cross-laminated sets, mud drapes on ripple laminae and ripple forms, and stratal bundling of sand-rich and sand-poor strata. A plot of tidal set thickness vs. ordered set number reveals a quasi-regular pattern, but it does not display the pattern expected for neap-spring tidal bundles. The tidal bundles are readily observed by their resistance to weathering with the sand-rich part forming small ledges and sand-poor part forming small benches or recesses.

Original and image-processed photos were used to correlate stratal surfaces across the roadcut. Two-meter thick strata with horizontal to low-relief erosional contacts characterize the lower three-quarters of the exposure; tidal bundles dip at low angle in the lower part grading to horizontal in the upper part. Slumped and fluidized sandstone lenses with several meters of erosional relief characterize the upper one-quarter of the exposure. In addition, each upward successive lens is wider and thicker (reaching 6m) than the underlying lens. These features strongly suggest that the Labette-Peru was deposited in tidal channels that became more proximal with time (i.e. shoaling upward).