

Rhythmic vs Episodic: The stratigraphic record of the tidal and fluvial interactions in marginal marine, non-channelised setting (Lajas Formation, Neuquen Basin, Argentina).

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The transition from fluvial to tidal settings includes a relatively wide zone characterized by the interaction of unidirectional fluvial currents, oscillatory tidal currents and other shallow-marine processes. Most studies on the fluvial-tidal transition have been carried out in channelized settings, thus how tidal and fluvial processes interact in non-channelized areas is not still completely understood.

The tide-influenced Middle Jurassic Lajas Formation is well exposed in several kilometres long outcrops, which offer an opportunity to investigate fluvial-tidal interactions in marginal marine, non-channelized settings. Many stratigraphic sections have been studied in detail by sedimentological logging, facies and geometry analysis. Photopanel interpretations were also made to capture architecture.

The 50 m thick study section shows an overall regressive trend, passing from marine mudstones/shell-rich beds, into subtidal-to-intertidal flat-bedded sandy-heterolithic deposits and ending with upper intertidal mudflat deposits and supratidal carbonaceous black siltstones and shales. Non-channelized tidal deposits are organized into regressive fining upward cycles (1-3 m thick) typically showing rhythmical interbedding and/or interlamination, bidirectional current ripples, 3D dunes with bundling and abundant coaly/muddy drapes. These deposits are usually cut by tidal, fluvial and tidal/fluvial channels or by moderately/well sorted tabular sandstones deposited during episodic floods due to stronger fluvial input. These latter deposits usually show erosive bases, rip-up mud clasts and small-scale load structures and may be organized into bedsets (1-2 m thick) with a coarsening and thickening upward trend.

The initial interpretation of depositional environment is that of a bay in which fluvial process can locally be dominant, but in which tidal processes prevail away from fluvial input points and at times between seasonal (?) river floods. The exact nature of the coastline is yet to be determined.