

SEISMIC SCALE BOTTOMSET FACIES OF A MIXED CARBONATE-SILICICLASTIC RAMP: THE JURASSIC-CRETACEOUS VACA MUERTA FORMATION IN THE PICÚN LEUFÚ AREA, NEUQUÉN BASIN, ARGENTINA

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A preliminary sedimentological analysis was carried on in two stratigraphic sections of the Jurassic-Cretaceous Vaca Muerta Formation exposed in the Picún Leufú area, Neuquén basin, central-western Argentina. The Vaca Muerta Formation comprises shallow-marine mudstone, marl and limestone lithofacies with high organic matter content. At a seismic scale, these deposits constitute aggrading bottomset reflections followed by prograding, sigmoidal foreset reflections downlapping over the bottomset top. In outcrop, deposits lacking visible downlap terminations were correlated with the bottomset reflections. These strata display important facies variations, and were subdivided into shoreface and open bay (FAA), mixed carbonate-siliciclastic ramp (FAB) and depositional lobe (FAC) facies assemblages, representing retrograding-prograding and retrograding successions. The first retrograding interval is composed by the FAA (~5.5 m thick), which is separated from the underlying eolian dune deposits of the Quebrada del Sapo Formation by a sharp and erosive surface. The prograding interval is developed above the FAA, and consists of a thick succession (~100 m) of FAB and FAC, making the bulk of the bottomset stratal thickness. The FAB is composed by outer ramp and mid ramp facies, whereas the FAC consists of distal lobe fringe, lobe fringe and lobe facies. The prograding succession starts with lobe fringe and distal lobe fringe deposits, which are the product of hyperpycnal flow sedimentation in an outer ramp setting. These facies are followed by a slumped outer ramp capped by mid ramp facies and a monotonous package of outer ramp facies. The succession is interrupted by the second retrograding interval composed by lobe facies, which ends up with a maximum flooding surface at the top. In short, the sedimentological dataset allows facies differentiation of homogeneous seismic scale strata, due to the recognition of (1) a normal transgressive event at the base, and (2) the progradation and subsequent retrogradation of a depositional lobe system in outer ramp and mid ramp settings subject to hyperpycnal flow deposition.