

**Theme 6. Shallow-marine clastic depositional systems****Special Session 6.5.** Spatial and temporal variability in coastal to shelf environments

Poster presentation

## Variability in process regime in the Lower Cretaceous Pilmatué marginal-marine system (Neuquén Basin, Argentina)

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Marginal-marine environments show a large number of physicochemical processes (e.g., fluvial currents, tides, waves, salinity changes) that operate at different temporal and spatial scales. To better understand this complexity this study focused on the succession of the Pilmatué Member (Agridio Formation, Lower Cretaceous, Neuquén Basin, Argentina) with the aim to unravel the sedimentary processes, facies associations and accumulation of this marginal marine system. The succession was studied with log descriptions and facies analysis using a total of 150 m of cores from two distinct wells. The succession is siliciclastic dominated, arranged in a general coarsening upward trend and consists of five facies associations interpreted as: delta plain, distributary channels, mouth bar complex, distal-delta front and transgressive deposits. The distal-delta front contains very-fine sandstones interbedded with bioturbated mudstones with flaser to horizontal lamination. The mouth-bar complex involves a variety of carbonaceous-rich very-fine sandstones with horizontal lamination or structureless. The distributary channels show erosional bases and consist of carbonaceous-rich very-fine sandstones with cross bedding, asymmetrical ripples, intraclast mudstones and soft sediment deformation. The delta plain includes mudstones and very-fine sandstones with asymmetric ripples, root marks and high bioturbation index. Finally, the transgressive deposits consist of bioclastic sandstones. The succession was interpreted as a deltaic system recording a progradational shallowing-upward trend and changes in the depositional processes from wave-dominated, tide-influenced distal-delta front deposits to proximal fluvial-dominated delta-plain deposits. Understanding spatial-temporal variability in process regime recorded in similar marginal-marine successions requires a bed by bed detailed description, which, in this study, was allowed by the superb quality of the Pilmatué Member cores. This study demonstrates that even within relative thin packages (10–15 m) the system does not necessarily have to be “one process dominated” but show a variability of process as the system shifts between proximal to distal environments.