

Interrelations among tectonic and sedimentary controls on 10 Myr sedimentation rates evolution (South-Pyrenean foreland basin).

ABSTRACT

Foreland basins are characterized by the propagation of the deformation front towards the foredeep. This is typically accompanied by the incorporation of foredeep portions to wedge-top depozones leading to piggy-back basins. The transition from foredeep to wedge-top is usually related to a reduction of the sedimentation rates (SR). The specific objective of this study is to investigate the evolution in time and space of the SR along the Tremp-Jaca basin (TJB) by integrating the published data with strategically selected new logs and relate them with the local subsidence.

At Eocene the TJB was divided in two connected sub-basins, the proximal thrust-top Tremp-Graus basin and the distal foredeep Ainsa-Jaca-Pamplona basin. A dynamic tectonic setting modified the subsidence distribution, and conditioned the sediment routing system. With the objective of approaching subsidence and the sediment routing system, a comparison of SR was made from the study of 12 logs representative of different positions in the basin, all accompanied with sufficient chronostratigraphic information, particularly magnetostratigraphy data. Ten of these logs (total thickness of ... m) were taken from literature; the other two were measured for the purpose, adding 2325 m of section completed with magnetostratigraphy data. The logs were correlated into a panel and the basis to derive compaction-corrected sedimentation rates for each magnetozone.

Three main types of depocenter were recognized: (a) regional tectonic dominated, associated to the foredeep depozone; (b) local tectonic dominated, related to thrusting, folding and salt tectonics on the wedge-top depozone; and (c) depositional dominated related to the underfilled to overfilled accommodation front advance, with different situations associated with transgressive or regressive events. Our results show an evolution of the SR values and their relation to the depozone migration coeval to the TJB evolution allowing us to distinguish two evolutionary stages of the TJB Eocene: The Lutetian stage with a very variable SR in a more compartmentalized basin (wedge-top, foredeep and forebulge depozones) controlled by the Pyrenean tectonic structures, and the Bartonian-Priabonian stage, when the whole area had been incorporated into the wedge-top, with generalized reduction of the SR values in a more connected basin. However, SR distribution expected for the main depozones is not always stated since local variations related to the basin infill and tectonics of the wedge-top modify the general trends.

DECISION

Oral

TOPICS

Sedimentary Processes (includi...

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Oral Session

11.C Sedimentology at reservoir-scale: recent improvements and way forward

2:00pm - 3:30pm

Friday, 13 September 2019

2:00pm - 2:15pm

Reservoir-scale facies analysis of a Zechstein 2 carbonate outcrop analogue, northern Germany

» Ms. Kim Nokar¹, Dr. Stefan Back¹, Dr. Lars Reuning², Mr. Philipp Meissner³, Prof. Peter A. Kukla¹

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View Presentation

2:15pm - 2:30pm

Carbonates through Time and Space: Carbonate Prediction and Reservoir Characterization