



Relationship between tectonic and paleoenvironmental evolution in the Tres Cruces foreland basin, Northwest Argentina.

Juan Pablo Villalba Ulberich and Claudia Inés Galli

INECOA - CONICET, Instituto de Geología y Minería - UNJu, Argentina (jpvillalbulberich@gmail.com)

The foreland basin of the Central Andes in NW Argentina is formed by partially unconnected basins limited by uneven high ranges. The Tres Cruces Basin is located in the foothills of the Central Andes in the Eastern Cordillera of NW Argentina. This basin resulted from a Cretaceous to Paleogene rifting event (Salta Rift Basin) and from Neogene foreland basin stages (Tres Cruces Basin) to Quaternary intermountain Basin. The propagation of deformation in this sector of the Andes is influenced by inherited structures (e.g. Cretaceous extensional faults), which have been reactivated during Andean compression as high angle and oblique reverse faults. Analysis of the Tres Cruces Basin along the seismic line, integrates a new lithostratigraphy, subsidence analysis, new interpretations of seismic lines and a balanced cross-section. The integration of internal features of syntectonic units from the analysis of lithostratigraphy and paleoenvironment evolution, the paleocurrents analysis and the restored basin geometry allow us to link the basin evolution history related to orogenic growth (spatial/temporal loading configuration). In this context, the Tres Cruces Basin exhibit a sedimentary fill that would be expected for a foreland basin with an orogenic wedge advancing eastward. Three units can be distinguished: Casa Grande, Rio Grande and Pisungo Formations. Casa Grande Formation has a very difficult contact with Lumbrera Formation. In some places is transitional, in others erosional or by a progressive unconformity. Rio Grande Formation is transitional to Casa Grande in most of the areas and by an unconformity in the East of the basin. The beginning of Pisungo Formation is related with an increment of the size of the clasts and by the presence of Santa Bárbara Subgroup as a member of clasts. The paleoenvironment evolves from a meandering system (Casa Grande Formation), into a braided system (Rio Grande Formation) to a proximal alluvial fans composed by debris flows (Pisungo Formation), showing a progradation from a distal to a proximal environment with a progressive decrease of the accommodation space.