UNIVERSITAT DE BARCELONA

UAB Universitat Autònoma de Barcelona

MASTER OF RESERVOIR GEOLOGY AND GEOPHYSICS

Structural controls on the evolution of the Serranía Aguaragüe Centro (Subandean zone, Bolivia): Evidences from surface, sub-surface and kinematic modelling

Master's Degree Final Project

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ABSTRACT

The Serranía Aguaragüe Centro is a tightly folded surface anticline located along the Aguaragüe structural trend within the Subandean belt of southern Bolivia. Complex geology and poorly imaged seismic profiles in the area make difficult to interpret the folded structures in the core of the anticline. Consequently, it is necessary to aid the process of seismic interpretation through the use of kinematic modelling, structural techniques and all available analogs in the Subandean zone of Bolivia. This project presents the process of developing a conceptual structural model applied to the main structure in the Serranía Aguaragüe Centro, Los Monos Anticline, considering key observations from surface, sub-surface data and kinematic modelling. Different structural styles have been tested; fault-bend and fault-propagation folds models seem to best characterize the structure. We also used structural restoration to validate the structural interpretation of key seismic lines within the area of interest. Three balanced cross-sections have been constructed: the shortening estimates and structural evolution derived from the sequential restoration allows us to understand the structural controls on the formation and evolution of Los Monos Anticline. Pervasive internal shear and folding within the Intermediate décollement, Los Monos Formation, controls the accommodation of shortening in the structure. The Main Basal Silurian Detachment controls the Lower Devonian units' deformation generating an Overlapping Ramp Anticline geometry that characterized the core of the anticline. The evidence of four-way dipping closures of the structure, generates an exploration interest to investigate these deeper formations as potential gas reservoirs in this zone.

Keywords: Subandean, Bolivia, Aguaragüe, fold-thrust belt, Los Monos, Kirusillas