

## Regional transect through the Spanish Pyrenees and structural control on basin architecture

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### Abstract

The Spanish Pyrenees shows very good development of pre, syn and post tectonic sedimentation within a Fold Thrust Belt. In this study geological maps, field observations and well data are utilized to construct a regional transect through the Spanish Pyrenees and to describe how structures modify the basin fill. The tectonic history of the Spanish Pyrenees begins with early rifting (250 Ma) which was followed by the main phase of compression (35 Ma). The northernmost part (hinterland) of the orogen, the Nougéras Zone (axial zone) shows evidence of antiformal stacking and thick skinned tectonics whereas the southern (foreland) Ager and Ebro basins show typical structures of thin skinned tectonics. A piggy-back basin termed as the Tremp Basin exists to the south of the Nougéras Zone. As the detachment horizon is provided by the Triassic Salt, the absence of Triassic salt in the frontal area resulted in the back-thrusting and thus a triangle zone exists between the frontal thrust to the north and the Ebro Basin to the south. The basin has undergone multiple phases of deformation during the collision tectonics. The compression utilized the preexisting structural weakness created during the earlier extension. The salt horizon present at base Triassic provides the detachment. This has resulted in the development of inversion structures as well as thickness variations. The progressive development of the Pyrenean Fold Thrust Belt resulted in well-developed syn-tectonic strata that help constrain the relative timing of the structures. The Garumnian growth strata show that the Boixol Thrust is older than the Montsec Thrust. The stratigraphy and geometry of the Boixol Anticline is the result of reactivation of the earlier normal fault. Intrabasinal structures such as the Boltana Anticline, Mediano Anticline and the Buil Syncline control the distribution and location of the sediments by modifying the paleoflow directions.