

Seismic Structural Interpretation of the Furrial Producing Trend, Eastern Venezuela Thrust Belt

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The Furrial trend is a 50 km long anticlinal structure broken by transverse saddles into three giant producing structures: Furrial, Carito, and Santa Barbara/Bosque. These fields currently produce 500,000 bbl/d from sandstones of late Cretaceous to Early Miocene age. Regional integration of 1000 km² of 3D seismic surveys shows a continuous allochthon above a regional thrust with a displacement of 8-10 km. The crest of the anticline is typically cut by minor backthrusts and backfolds in all areas, and by major imbrications in Carito.

The saddles segmenting the hangingwall anticline are transverse extensional structures with large-displacement growth normal faults. The growth faults and growth synclines are contemporaneous with deposition of the Miocene Carapita Formation as well as the emplacement and compressional folding of the thrust sheet. The saddles are dextral, extensional displacement transfer zones which appear to accommodate the differential translation and rotation of the major segments of the hangingwall anticline of the thrust sheet.

3D seismic facilitates detailed structural mapping of secondary thrusts and transverse faults essential to map details of reservoir compartmentalization. Regional velocity modeling and seismic depth migration are now utilized for advanced studies of structural geometry and reservoir simulation.

Shallow imbrications, out-of-sequence thrusts, and growth unconformities create major velocity pullups and seismic imaging problems for the producing structures, which lie at depths of 12-18,000 feet.