

Role of Salt Tectonics in the Evolution of the Safi-Agadir Segments of the Moroccan Atlantic Margin and its Onshore Basins

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Integration of geological and geophysical data from the Safi-Agadir segment of the Moroccan Atlantic margin and its corresponding onshore basins indicates that the Triassic rift architecture and the post-sedimentary mobility of massive salt associated with rifting continuously influenced sedimentation and tectonics of this area from early Mesozoic to the present time. This particular area is differentiated from the rest of the Atlantic Moroccan salt basin by the fact that the salt in this segment extends onshore. Numerous salt diapirs were mapped here using 2D reflection seismic data. Due to the large number of wells in the onshore Essaouira salt basin, the temporal evolution of the salt deformation is better constrained here than in the offshore areas. Based on this study, the overall gravity-driven salt tectonics was strongly influenced by the upper Cretaceous to Tertiary compressive events associated with the High Atlas orogeny. The impact of these compressive Atlasic events on the salt tectonic style diminishes rapidly to the south and to the north of the Essaouira basin.

A great variety of halokinetic structures were identified including gentle salt-cored folds and pillows, compressional diapirs, salt withdrawal synclines and completely allochthonous large salt sheets and canopies. These structures show an areal/temporal distribution that is progressively more complex basinward from the onshore basins towards the deepwater basin, defining specific salt tectonic domains characterized by different halokinetic features. This complexity offers a great variety of favourable settings for potential hydrocarbon traps, including subsalt and pre-salt plays.