

## **Reservoir Rocks developments in the Moroccan Atlantic Margin**

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Careful analyses of the existing onshore well data, outcrop sections and seismic data lead to identification of several potential reservoir intervals that have likely widespread distribution in the offshore of the Atlantic margin of Morocco within the Mesozoic and the Cenozoic sections.

Pre-Cambrian and Hercynian granites and meta-sediments in the Moroccan meseta, the Anti Atlas, the Tindouf and Adrar Soutouf, provide the main source of silico-clastic sediments. The most favorable geological time laps identified so far are in the Lower Jurassic, the Middle Jurassic, Lower Cretaceous and tertiary. Investigations on other potential intervals of the Upper Cretaceous are still ongoing.

Following the Jurassic marine incursion in the central Atlantic, carbonate and shale sedimentation prevailed in various Atlantic margin basins. However, relative falls of sea level in the Lower Lias and Lower Mid Jurassic lead to installation of fluvial and deltaic systems on the shelf and turbidite complexes in the basin.

More than 100m and 300m of fluvio-deltaic conglomerates and sandstones of Upper Lias Amsittene and Middle Jurassic Amskroud formations respectively crop out in the western High Atlas.

Areas with narrow shelf, north of the western meseta and south of the High Atlas, constituted privileged entries of silicoclastic sediments into the basin and therefore even Upper Jurassic carbonate sediments, are either rare or absent. Some 700m of Jurassic sands silts and shale are preserved on Fuerventura Island, indicating that clastics were transported over the shelf and out into the deep environment.

End of Jurassic is marked by a sea level fall and short lived sub-aerial exposure of the carbonate shelf, leading to intense karstification. Relatively rapid transgression of lower most Cretaceous was followed by prominent fall of sea level which resulted in the development of mega deltaic systems across the shelf.

Laterally westwards, seismic shows evidences of channel systems in the slope and basin floor fans development in the paleo-deep water. Further west, Lower Cretaceous distal sandy turbidites are exposed in outcrops on the Fuerventura Island and have been penetrated by DSDP wells.

The Tan Tan and Boujdour fans are tow of the many deltaic bodies that developed on the Moroccan Atlantic Margin during the Lower Cretaceous. Yet further to the south in Mauritania and Senegal, lies tow other Lower Cretaceous deltas.

Base Tertiary is marked by an erosional unconformity. Uplift of adjacent hinterlands resulted in rejuvenation and the deposition of coarse clastics, probably of Eocene age. It is likely that the shelf areas were sub-aerially exposed and sediments had by-passed the shelf in broad river systems and deposited directly into mini basins on the slope and the basin. In the mid-Oligocene re-newed uplift, probably associated with the uplift of the Moroccan mesetas and inversion of the Atlas Gulf, to form the Atlas mountain chain, led to tremendous influx of silico-clastic sediments that were transported westward, to form a depositional thick in the deep water area.