



# The continental margin of Morocco : seismic sequences, structural elements and the geological development

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Seismic sequences, structural elements and the geological development of the Moroccan continental margin, which is subdivided from the south to the north into the North Tarfaya segment, the Tafelney Plateau, the Essaouira segment, the Mazagan Plateau, the Prerif segment, are discussed.

The dominating structural unit of the Moroccan continental margin is a NNE-trending zone of salt diapirs. This zone starts southeast of Fuerteventura and continues to the north beneath the Prerif nappes. The age of the salt is probably Upper Triassic/lowermost Jurassic. In the offshore areas, halokinesis started during the Lower Cretaceous. The western boundary of the salt diapiric province is sharp and locally fault controlled. In the south, within the North Tarfaya segment, the diapiric zone is 10-45 km seaward of the Upper Jurassic platform edge, an additional prominent structural unit of the continental margin of Morocco. The diapiric zone broadens within the Tafelney Plateau and Essaouira segment and continues into the Southwestern Moroccan Coastal Basin.

The western boundary of the Moroccan salt diapiric province fits well with the eastern boundary of the diapiric zone of Nova Scotia/Canada. This means that before separation of the African and North American plates, a uniform evaporite basin existed. This basin broadened during the early development of the margin when the crust was uplifted, eroded, thinned and stretched by unknown crustal and subcrustal processes. The observed abnormal crust beneath the Moroccan continental slope and deep sea is interpreted as an attenuated continental crust which is

contaminated by basaltic intrusions. In our opinion, the distinct western boundary of the Moroccan salt diapiric province marks the beginning of the actual separation of Morocco and Nova Scotia.

After the actual separation, which has been tentatively placed in the Sinemurian, presumably carbonates were deposited in the uniformly subsiding basin. About 45 million years after deposition of red sediments and occurrence of basaltic volcanism in the Southwestern Moroccan Coastal Basin, there was more rapid subsidence in the Middle Jurassic of those parts of the basin which are underlain by a contaminated thinned crust. This led to the formation of a slope, carbonate banks and carbonate platforms. Carbonate platform formation terminates in the lowermost Cretaceous in the North Tarfaya segment, in the Lower Cretaceous in the Essaouira segment and in the Upper Cretaceous/?Early Tertiary on the Mazagan Plateau.

Subsidence predominated until the Middle Cretaceous in the Moroccan continental margin segments with exception of the Mazagan Plateau. The Tafelney Plateau was formed during the Late Cretaceous as a result of the epirogenetic uplift of the Western High Atlas and intensive salt diapirism started.

This intensive salt diapirism, initiated by the epirogenetic uplift and associated with large-scale gravity slidings, caused the development of complex seismic structures in the outer parts of the Tafelney Plateau and Essaouira segment.

Major erosional events occurred between the Cenomanian and the Eocene as well as during the Oligocene and Miocene.

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