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Use of Outcrop Analogues to Constrain the Geometry and Facies Distribution of a Carbonate Nummulite Reservoir (El Gueria Formation, C137 and NC41 areas, Offshore Libya)

The El Gueria Formation consists of nummulite rich carbonates, which were deposited during Eocene times along the North Africa shelf on a wide carbonate ramp. This ramp, which was gently dipping towards the N-NE, is characterised by a series of E-W elongated structural highs that resulted from the compressive Pyrenean and Alpine tectonic phases that took place from Late Cretaceous to Mid Tertiary times.

The carbonate nummulite interval is characterised by an overall heterogeneous reservoir rock distribution, which results from the superimposition of depositional, diagenetic, stratigraphic and structural trends. In order to better understand depositional geometry and facies distribution in the subsurface, the Kesra Plateau outcrops in Central Tunisia (Jorry et al., displayed in the same poster session) has been used as an analogue.

In the subsurface, sedimentological core interpretation, dipmeter analysis, wireline log correlation and integration of 3D seismic data have allowed to reconstruct several lenticular, coarse-grained nummulite bodies separated by fine-grained bioclastic packstone facies. Based on analogy with the nummulite bodies examined in outcrops, the subsurface bodies have been interpreted as shallow water prograding bars. This interpretation suggests that true nummulite shoals, which correspond to the main reservoir facies, should not be present between the paleo-depositional highs that results from syn-depositional tectonic activity.