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# Enhanced Seismic Interpretation Using Outcrop Based Synthetic Seismic: Natih Formation, Oman

The rudist-bearing shallow water carbonates of the Natih and Mishrif Formations (Cenomanian) are hydrocarbon reservoirs throughout the Middle East. A high resolution sequence stratigraphic model of the Natih Formation was constructed from outcrops in Northern Oman. The section passes from a proximal carbonate platform to a distal intra-shelf basin. The model has identified three 3rd order depositional sequences, where a 'typical' cycle consists of basal organic rich marl-limestone which is overlain by a prograding platform of rudstone layers and incised by tidal channels.

Outcrops in the Adam foothills were sampled for petrophysical data, which were used to construct impedance models of the measured outcrop sections. Two measured sections: the Jabel Model at a regional scale, and the Wadi Model at a more localized reservoir scale, were used to produce synthetic seismic sections. These were then compared with subsurface seismic in the Mishrif Formation (subsurface age equivalent to the Natih Formation).

The synthetic seismic sections of the outcrop calibrated models can be used to 'push' the interpretation of subtler lower frequency industry seismic features, especially in the area of the shelf margin, the prograding clinoforms, and the resolution of the shelfal tidal channels. Confidence in the subsurface seismic interpretation of subtle features was enhanced by comparison with synthetic seismic sections constructed from a high resolution stratigraphic outcrop model.