

Modelling depositional, Structural and Diagenetic Geometries in the Benicàssim Carbonate Reservoir Analogue

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Abstract:

Carbonate reservoirs are very challenging to characterize because they typically present high internal complexity associated with heterogeneous depositional and diagenetic processes. This case study focuses on construct static reservoir models of the Benicàssim Outcrop analogue paying especial attention to the Benassal formation that comprises a succession of more than 1500 m of partially dolomitized carbonates in a Transgressive-Regressive system track, making it an ideal example of diagenetic modelling of carbonates. The purpose of this thesis is to study the methodology of geological modelling of an analogue reservoir using high resolution LiDAR Models, digital geological maps and stratigraphic column sections by generating: Structural Model, Facies Model and Petrophysical Model with Diagenetic geometries. Each of them is based on different techniques and algorithms in order to find the best way of capturing the properties of the reservoir. Additionally, also compare the importance of diagenetic processes in geological modelling. The results consist in five models: (i) Structural Model, (ii) Two Facies Models, one with the distribution of the lithofacies recognized in the area and the second one with diagenetic geometries, and (iii) Two Petrophysical Models, porosity and permeability describing reservoir conditions of a partially dolomitized carbonate reservoir.