

DEEP-MARINE RESERVOIR HETEROGENEITY IN STEEP-SIDED MINIBASINS – INFLUENCE OF BASIN PHYSIOGRAPHY ON SEDIMENTOLOGICAL PROCESSES AND BASIN-FILL CHARACTER

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ABSTRACT

Deep-marine sedimentary deposits are a product of the initial sediment gravity flow character and the character of the receiving basin. In small (a few to tens of km) mini-basins, flows interact with the bounding walls of the basin. The rate of flow deceleration against basin margins affects the style of deposition, with rapid deceleration often resulting in thick bedded sandstones which terminate abruptly, whilst gradual deceleration develops thin bedded turbidites which may 'run-up' topography for considerable distances. Soft-sediment failure, developing slides, slumps and debris flows, are also common in these settings. Together, these processes can result in complex reservoir characteristics, and variable stratigraphic trapping potential. This project will address this with a combined field-, core- and seismic-based project. The field study will focus on the Annot Sandstone of SE France, where multiple sections reveal the facies variability within the onlapping units. The study will examine the poorly studied eastern margin of the Annot sub-basin, and will utilise a brand-new helicopter-based lidar survey of the well known Chalufy onlap sections. Core from salt-walled mini-basin reservoirs of the UK Central Graben will be compared and contrasted to the outcrop examples, and used to better understand a subsurface analogue revealed in 3D seismic data again from the salt-walled mini-basins of the Central Graben. The project, through the development of conceptual models, will deliver an enhanced understanding of reservoir heterogeneity in complex basin settings and will be particularly relevant to the often more complex and subtle hydrocarbon prospects presently targeted in mature basins.

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