

# **Multidisciplinary Examination of a Deepwater Turbidite Reservoir Outcrop Analogue, Taranaki Basin, New Zealand**

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Late Miocene basin floor turbidite fans of the Mt Messenger Formation, superbly exposed in cliff sections on the west coast of New Zealand, represent an excellent analogue for deep-water turbidite reservoirs. In the Tongaporutu River area of the Taranaki Basin, these rocks are transected by an array of normal faults of various orientations and throws that are also well exposed within a series of embayments along the cliff face. A high-resolution multidisciplinary examination (TURI Project) of the structural and stratigraphic elements of the field site is currently underway. The main aims of this study are to characterise the hydraulic connectivity and conductivity in complex faulted thin-bedded clastic reservoir rocks. This information will be used to devise upscaling strategies that successfully account for the effects of sub-seismic faulting (juxtaposition, membrane sealing) and sedimentary variability on fluid flow in reservoirs of this kind. Outcrop mapping and 3-D photogrammetry of the cliff section are to be combined with behind outcrop 3-D Ground Penetrating Radar (GPR), high resolution 2-D/3-D seismic, drill coring and logging in order to construct a detailed 3-D geological framework model. Reservoir flow simulations based on the framework model will then be compared with hydraulic pump tests performed in wells situated on either side of a selected fault. Initial results from the outcrop structural and stratigraphic mapping, 3-D photogrammetry and 3-D GPR are already providing new insights into the nature of this world renowned turbidite outcrop analogue.