

Stratigraphic Architecture of Turbidites in a Forearc Setting: the East Coast Basin, North Island, New Zealand

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This study investigates the deep-water turbidite deposits of the Hikuwai Sandstone, an informally named formation, located in the Raukumara Region of the East Coast Basin (ECB), North Island, New Zealand. The formation is fine grained, volcanigenic, and a potential reservoir of a Miocene forearc basin. The ECB is largely comprised of numerous elongate sub-basins, and therefore the Hikuwai Sandstone likely represents the localized filling of a similar type of mini-basin. The sandstone has high lateral continuity suggestive of sheet-like deposition, and is well exposed along approximately 10 km of coastal cliffs. Cliff exposures are typically around 200m high and present an excellent opportunity for architectural analysis through construction of high quality digital photomosaics.

Preliminary stratigraphic data indicate that the system consists of mostly low-density sediment gravity flows and is defined primarily by partial Bouma sequences. Common sedimentary structures include ripples, climbing ripples, planar laminations, and soft sediment deformation features such as wavy and convolute laminations. Although the beds appear to have great continuity, compensational stacking is observed as layers thicken and thin laterally until ultimately onlapping or downlapping onto surrounding beds.

The goal of this study is to observe vertical and horizontal changes in the geometry and stratigraphy of the Hikuwai Sandstone in order to develop a conceptual depositional model for sub-basin fill in a tectonically active forearc system. Such modeling will improve the understanding and architectural predictability of sub-basin reservoirs and address the primary factors controlling their development.