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by *Ricardo Bertolotti*
Crown Minerals
New Zealand

Frontier Sedimentary Basins of New Zealand— East Coast and Great South Basins Revisited

New Zealand sits on a large continental shelf of over 4 million square kilometres with several extensive sedimentary basins (Figure 1), all of which are prospective for oil and gas. New Zealand's sedimentary basins are only lightly explored.

Most of New Zealand's sedimentary basins are composite basins, reflecting various phases of structural evolution and sedimentary fill. From oldest to youngest,

To date all of New Zealand's commercial oil and gas discoveries have been located within the Taranaki Basin.

New Zealand's sedimentary basins can be divided into syn-rift, passive margin and active margin episodes that reflect the broad tectonic development.

The development of rift basins in the mid-Cretaceous was associated with Gondwana break up and sea floor spreading associated with the opening of the Tasman Sea. The New Zealand sub-continent continued to drift away from the former Gondwana continent and during this period of tectonic quiescence basin development was characterized by regional post rift thermal subsidence and widespread marine transgression. In Middle Eocene to Oligocene, **International Meeting** continued on page 33

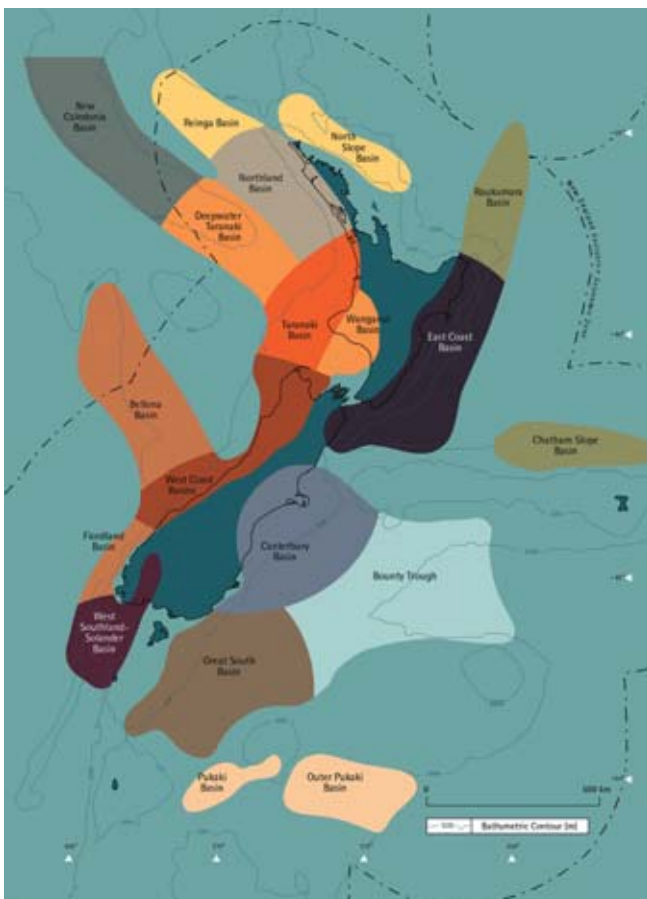


Figure 1. New Zealand Hydrocarbon Basins

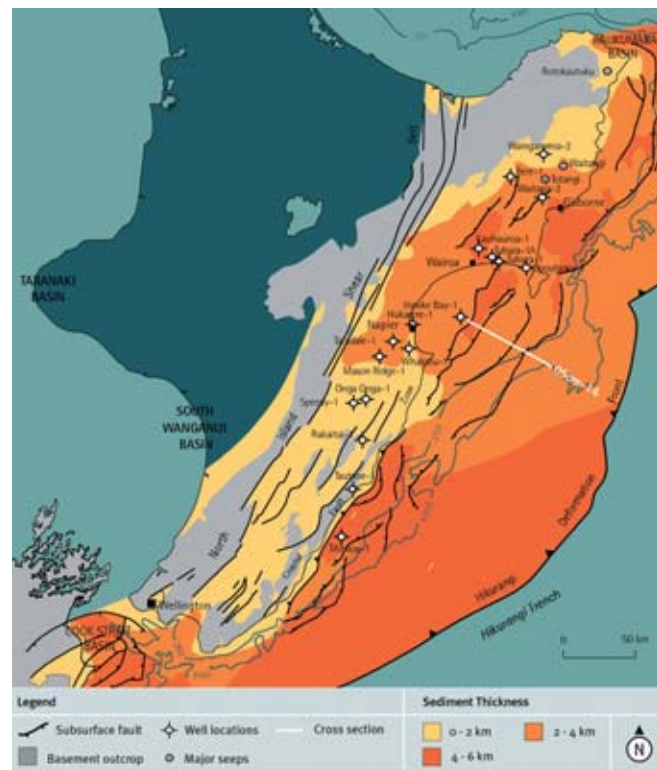


Figure 2. East Coast Basin Geological Map

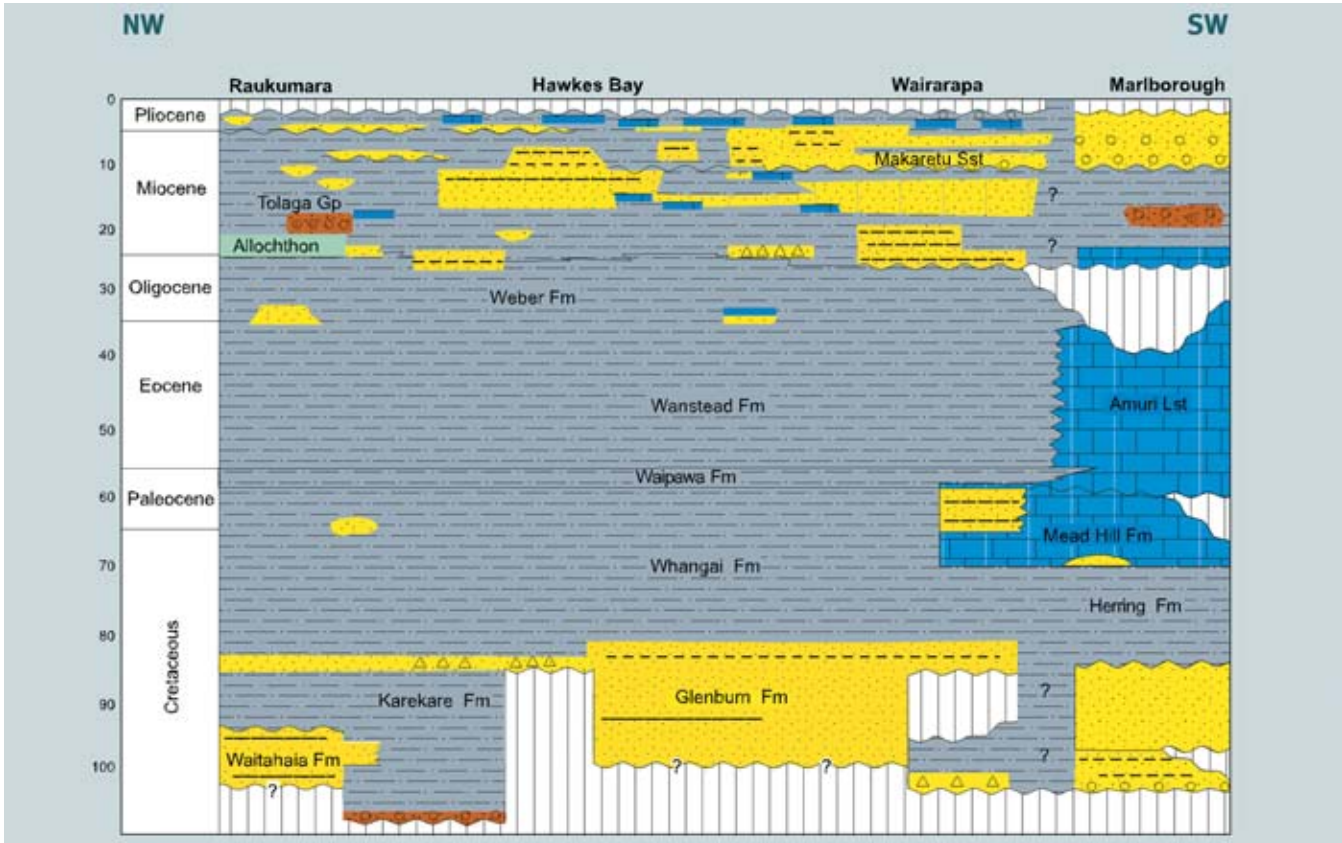


Figure 3. East Coast Basin Stratigraphy

International Meeting *continued on page 34*

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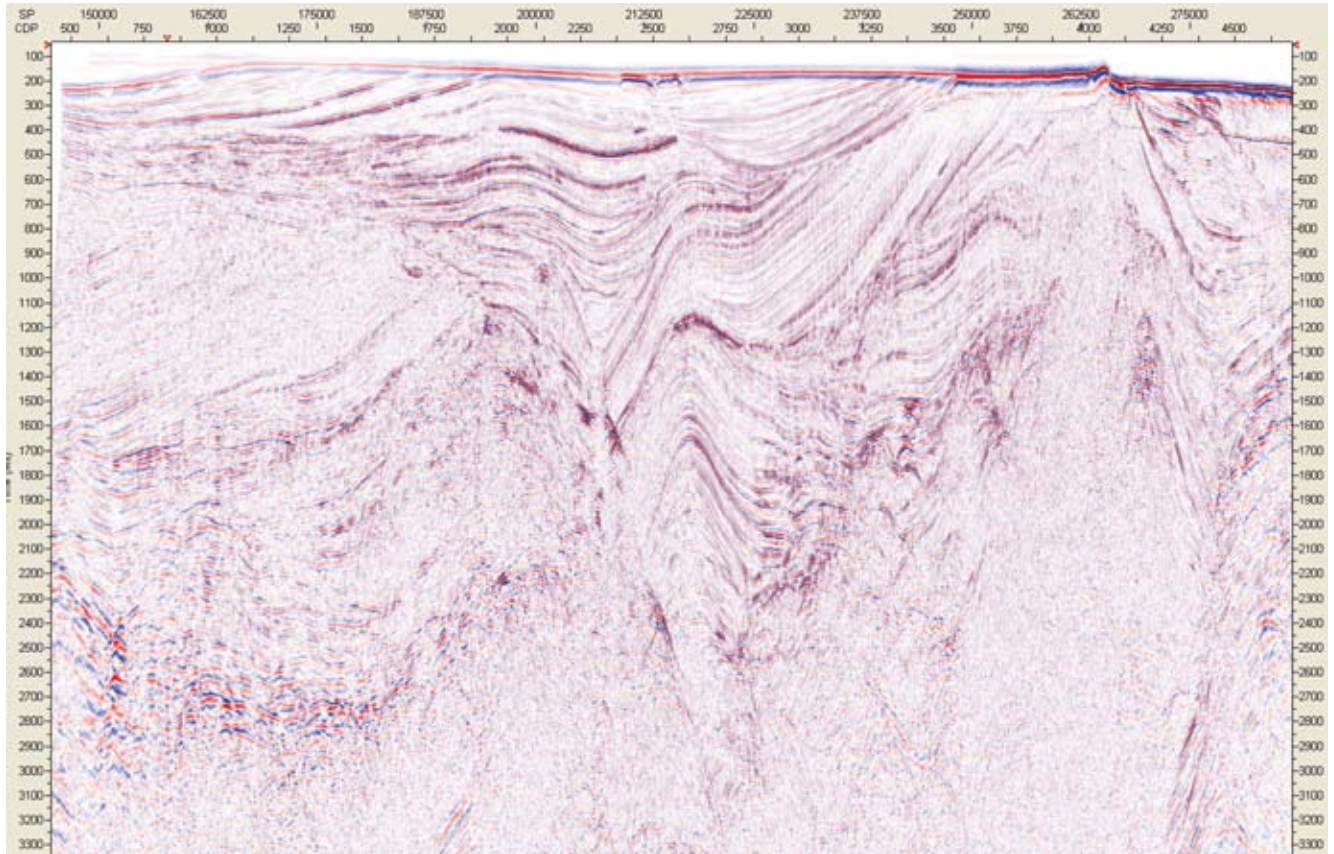


Figure 4. 05CM-1 Satck Section from NW to SE

International Meeting *continued on page 39*

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sea floor spreading to the south of New Zealand brought about changes in structural and sedimentation style to the southern and western basins and the initial development of the Austalian–Pacific Plate boundary across New Zealand. By mid Oligocene subduction of the Pacific Plate was impinging upon northeastern New Zealand. In early Miocene the Alpine Fault formed, in

response to convergence of the southward-propagating subduction zone with the Chatham Rise. The Alpine Fault formed a link between the west-dipping subduction and Emerald Basin spreading and oblique extension in the southwest, and became the primary focus of dextral dislocation between the Pacific and Australian Plates.

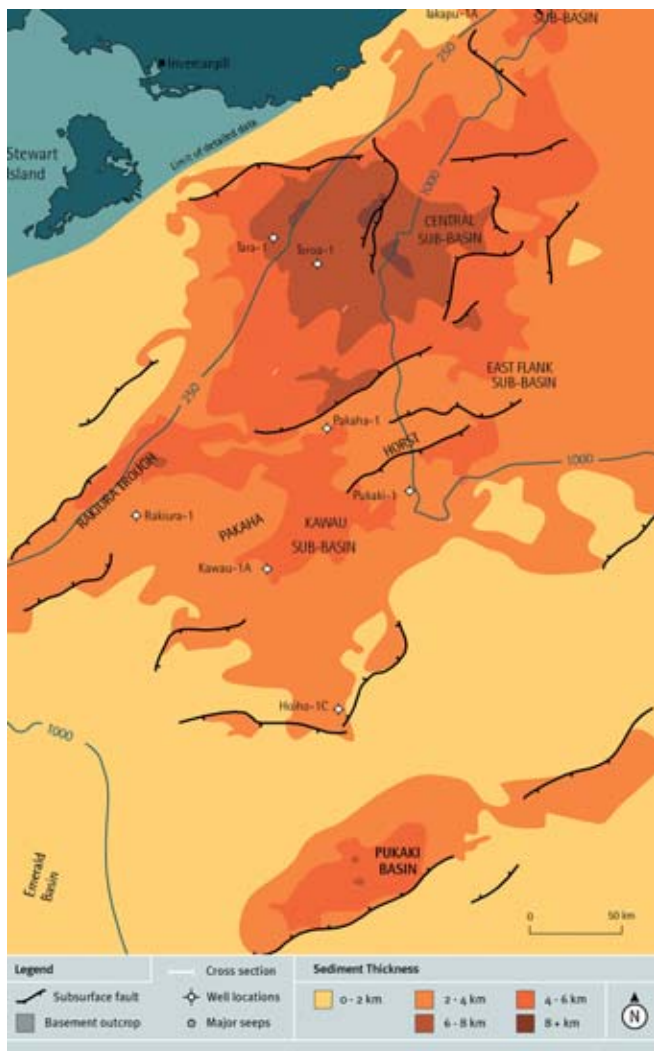


Figure 5. Great South Basin Geological Map

To date all of New Zealand’s commercial oil and gas discoveries have been located within the Taranaki Basin. However, surface seeps, of oil and gas are **International Meeting** *continued on page 41*

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present in several other areas, particularly in the East Coast Basin (Figures 2 and 3) and Great South Basin (Figures 3 and 4) where oil and gas have been discovered in wells.

Recent government funded seismic data acquisition along the East Coast (Figures 5 and 6) has provided new evidence of the tecto-stratigraphic basin evolution analogous with Californian coastal basins and deep water Sabah, Borneo.

The Great South Basin has been revisited by analysis of recently reprocessed seismic data. This data shows very large structures and a thick sequence of hydrocarbon bearing early Cretaceous to Palaeocene sediments.

Today, more than ever, these basins present a highly prospective destination for explorers. ■

Biographical Sketch

RICARDO BERTOLOTTI graduated with a Master's degree from Royal Holloway, University of London. Ricardo has experience in seismic acquisition, interpretation and prospect generation working with ENI, Lasmo and CGG in various international settings including Venezuela, Pakistan, Timor, Indonesia and Trinidad. He is currently Senior Petroleum Geophysicist at Crown Minerals in New Zealand. Ricardo is a Member of the Venezuelan Society of Geophysicists (SOVG)



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