Abstract

Tectono-stratigraphic Evolution of Western Gorontalo Bay, Indonesia

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Gorontalo Bay exists as one of eastern Indonesia's mystery basins in terms of its tectonic evolution and stratigraphy. Detailed interpretation of newly acquired regional 2D seismic data provides an understanding of the tectono-stratigraphic evolution of the western part of Gorontalo Bay.

The formation of western Gorontalo Bay and adjacent areas is related to thermal subsidence initiated during the Early Miocene, associated with plate tectonic collision in Sulawesi (—23 Ma). This event initiated the development of the fore-arc basin along a NE-SW trending zone of weakness in Oligocene and older basement rocks. The NE-SW trending basin was filled by thick deep marine sediments. Subsidence was interrupted by a later uplifting event along the southeastern margin.

Carbonates became dominant in this basin following the formation of a thick carbonate platform. The shallow marine carbonates were developed widely in the basin before rapid subsidence to the present-day deep water **(2** km depth). This rapid subsidence is the result of the Celebes Sea subduction and trench rollback during the Pliocene (—5 Ma) to Recent.

The results from this study imply that this basin potentially has a petroleum system for future hydrocarbon exploration according to the depositional environments. Hydrocarbon could be sourced from mature deep marine sediments in the basin centre. Mixed grain rocks, fractures and local unconformities within the sedimentary mega sequences potentially form economical stratigraphic plays. These should be the major targets for hydrocarbon exploration in this area.



Figure 1. Available seismic in the Gorontalo Basin, northern Sulawesi

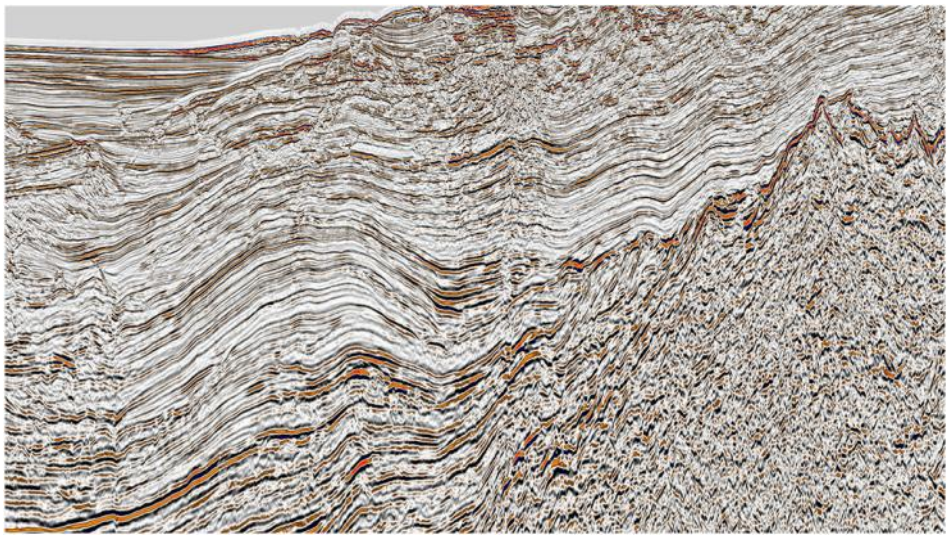


Figure 2. Example of seismic data from the Gorontalo Basin (source: Fugro / searcherseismic.com)

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