

Depositional Framework and New Stratigraphic Insights in the Kutei Basin

The Kutei Basin in East Kalimantan is Indonesia's most prolific hydrocarbon province. Recent discoveries such as Geng North-1, Gehem, and Gendalo-Gandang, now part of the Northern Hub development, underscore both its productivity and remaining potential. While mature, large areas—particularly in deep water—remain underexplored, with advances in seismic imaging and geological integration opening new opportunities.

This study develops a regional depositional framework using open-source geological and geophysical data integrated with extensive well information. A central element is the transformation of 119 vintages of 2D seismic (1969–2019) into a single “2Dcubed” volume covering 73,000 km², alongside modern 3D datasets. This provides a consistent platform for structural and stratigraphic interpretation. Calibration with 62 exploration and appraisal wells ensures strong geological control.

Well analyses—including sequence stratigraphy, chrono- and lithostratigraphy, facies interpretation, and gross depositional environment (GDE) analysis—were incorporated into the seismic interpretation. Data inputs included cuttings, core studies, correlations, seismic facies, and biostratigraphy. These were synthesized into calibrated facies and regional GDE maps across key petroleum system intervals.

Results reconstruct the basin's sedimentary history from the Late Eocene to Early Pliocene, charting depositional fairways, sediment influx, and connectivity into deep water. This highlights stratigraphic intervals of interest, identifies analogues, and delineates potential fairways in less explored areas.

The study demonstrates that even mature hydrocarbon provinces can yield new insights through innovative use of legacy data. Modern seismic acquisition provides quality control and further refines the depositional model. Collectively, results show that the Kutei Basin still holds significant untapped potential, especially in deep-water domains where prospectivity remains to be fully tested.