

ABSTDACT

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## Structural and Tectonic Setting of the Off-Shore Kutei Basin, Indonesia

The Kutei basin is located near the leading edge of the Sunda Plate where it is colliding with both the Australia and Pacific plates in a complex triple junction. The basin is far enough within Sunda that it is only mildly impacted by the activity at the triple junction, but it still contains much more complexity than one might originally imagine.

The basin began formation sometime near the end of the Eocene, similar to many basins across Indonesia. Extension between Sulawesi and Borneo likely occurred in conjunction with opening of the Celebes Sea to the north. In contrast to the Celebes, however, the Kutei is thought to be floored by extended continental crust rather than oceanic seafloor. The Eocene extension set up a basement fabric dominated by extensional and transform faulting. From latest Eocene through to early to mid-Miocene the Basin was passive or in a sag phase. During the Miocene to Recent the basin has felt the impact of the collision of Sunda with Australia and the Pacific, which has resulted in shortening between Sulawesi and Borneo.

We believe this shortening event results in the reactivation of the Eocene faults as well as generation of thin skin compressional systems. Deformation of the Miocene section is largely decoupled from the reactivated basement fault due to the presence of a thick highly overpressured Oligocene shale sequence deposited during the initial sag of the basin. Compressional structures dominate the modern Kutei basin from the onshore Samarinda anticlinoria to the deepwater fold belts and across the basin to the deep water fold belts along Sulawesi. The timing of activity on the fold belts is not uniform, with older folding in the southern Borneo margin to younger in the north. The most recent deformation, over the last several million years, occurs widely but is largely focused to the farthest north on the Borneo side. Deformation off Sulawesi also is largely in this most recent period. In addition to compression, there are several regions of extensional faulting and several regions dominated by strike-slip deformation.

The basin is broken into structural domains each of which have a distinct structural style, primarily based on deformation of the Miocene sediments. The distribution of those domains is seen to, in many cases, be controlled by the distribution of Eocene basement fabrics.

This framework provides a reference for exploration efforts by providing analog information within each structural domain and the trends within each domain. More so, it provides information on the differences between geographic areas that might otherwise appear to be part of a single trend. It also serves to illustrate domains and trends that have been untested or under-explored.