

## Meridian-parallel faults and Tertiary basins of Sundaland

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The pre-Tertiary core of Sundaland contains numerous North-South striking regional faults (Fig. 1). One that extends from the Thailand-China border via the Gulf of Thailand and Peninsular Malaysia into Sumatra is the longest at ~ 2,000 km (abbreviated as TBB). Two other long faults are the Vietnam Shear off the east coast of Indochina and another N-S fault in the gulf parallel to TBB. The other regional faults range between 200 km and 700 km. In the peninsula, the TBB is the Raub-Bentong suture that existed since the Middle Triassic. Faults within the suture show overprinting of normal faulting (down to east), upon dextral slip that in turn post-dated sinistral slip. N-S faults in the Malay Peninsula are considered the oldest set and date from the Jurassic or earlier. The TBB segment in Sumatra is the Bengkalis trough on which dextral slip had continued to affect Miocene strata. Similarly, N-S regional faults in the Tertiary basins of North Sumatra, Central Sumatra, South Sumatra, Sunda basin complex, Arjuna basin, central Thailand basin complex, Mekong, Nam Con Son, Malay and Penyu basins deformed strata as young as the Miocene. These regional faults show mainly dextral slip except the Peusangan (North Sumatra) and the northerly trending faults in Terengganu (Peninsular Malaysia). Left-lateral slip implies that the Terengganu faults are lag structures in the general extrusion of SE Asian crustal slabs towards SE and S. The sinistral slip on the Peusangan fault is attributed to spreading of the Andaman Sea basin since about 11 Ma ago. The geological history suggests that by the Middle Triassic, Sundaland had combined into a single microplate. Some of the meridian-parallel faults, such as the TBB probably have existed since that time. Other N-S faults may be younger, but perhaps most developed in the Mesozoic and a number of these structures became reactivated in the Cenozoic. It seems probable that lateral slip directions were different at different times, but that the latest displacement sense had been dextral. The origin of most of the N-S regional faults is problematic. The Vietnam Shear may be attributed to the opening of the South China Sea basin from Oligocene to about mid-Miocene. The TBB is a mid-Triassic suture between continental blocks. Those N-S faults traversing Cenozoic sediments are probably reactivated pre-Tertiary structures. The widespread distribution of these faults in Sundaland may mean that the entire region participated as a single unit in large-scale translations or rotations that have been suggested by paleomagnetic studies. Or, was Earth's rotation responsible for the formation of regional N-S faults in Sundaland?

The regional meridian-parallel faults of Sundaland have functioned as (1) originators/initiators of Tertiary basins such as the Mekong and Nam Con Son, as (2) determinants of basin location (Central Thailand and the Gulf of Thailand; sub-basins; Balam-Pematang troughs, Bengkalis trough, Benakat gully, Asri, Seribu, Arjuna, and relatively small basement depressions in the Malacca Strait), and as (3) modifiers of basin geometry (Peusangan fault in the North Sumatra basin; the large dextral offsets of fold series in the Malay basin). N-S faults across fold crests of the Malay basin were non-tectonic and formed by tightening of the folds in a persistent compressive stress regime.