The tectonic interpretation of variations in the gravity field over Southeast Asia as revealed by satellite altimeter measurements

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Laporan (Report)

Dr. Clive A. Foss gave the above talk on 30th November 1994 at 5.30 pm at the Geology Department, University of Malaya.

Abstrak (Abstract)

Satellite altimetry has been used to map the elevation of the earth's sea surface to a much higher resolution than has been possible before. The resulting maps show undulations which are due to variations in the strength of the earth's gravity field. Where the gravity field has high values the water is ponded up causing a topographic high, and conversely where there is a gravity low the sea surface is depressed. The sea surface elevation maps have been transformed to provide representations of the (free air) gravity variations over the marine parts of the earth's surface. For this study the Sandwell 1993 gridded data has been used.

The free air gravity map for marine Southeast Asia was corrected for gravity variations due directly to changes in water depth to provide a Bouguer gravity map which shows variations due predominantly to changes in density in the underlying rocks. A sketch interpretation is presented for this map and for various transforms of it computed to sharpen and enhance the image. Features which are resolved include deep crustal faults, some of which are surprisingly long. The size of structural domains defined by the extent of areas with subparallel fault directions is also surprisingly large considering the complexity of the geological history of the area.

Some of the mapped gravity variations can be related to changes in thickness of the sedimentary cover. In several cases these observed gravity variations are of markedly lower amplitude than is predicted from the known sediment thickness - indicating that the crustal structure of those sedimentary basins incorporates crustal thinning to produce a positive gravity variation which partially cancels the negative variation due to the low density of the sediments infilling the basin.

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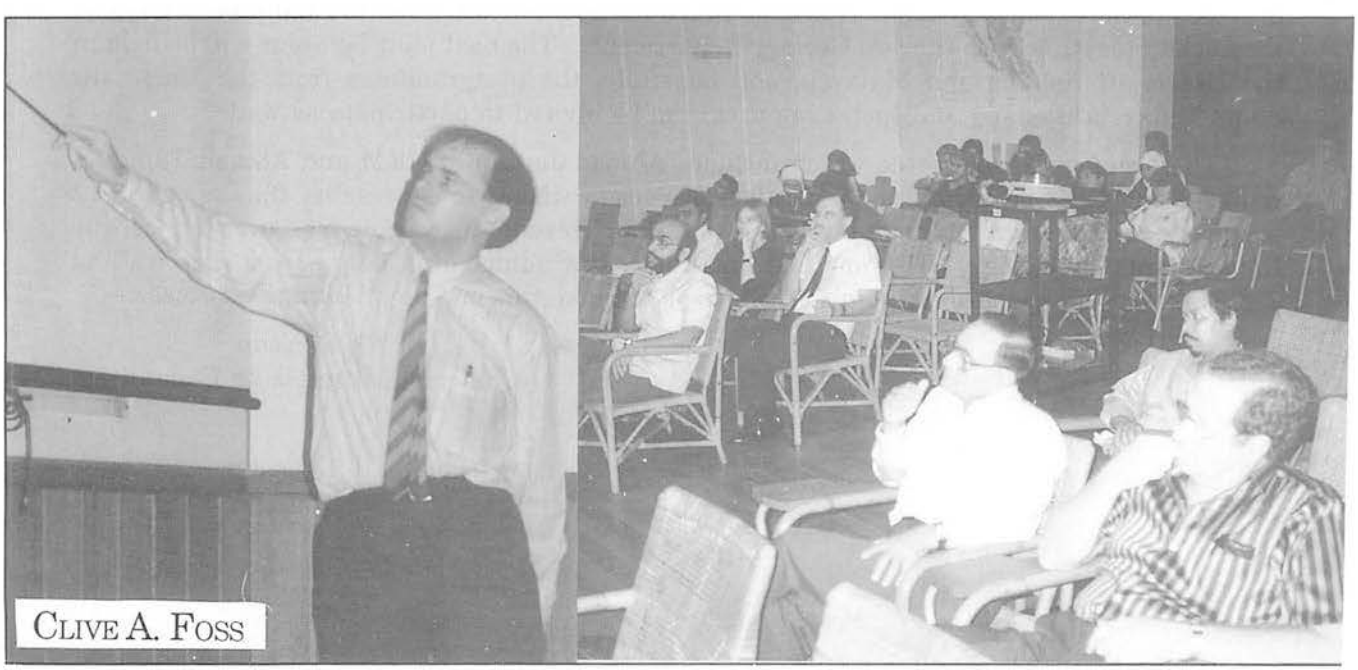

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