

SEISMOTECTONICS OF EASTERN  
INDONESIAN REGION

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A Digest Presented to the Faculty of the Graduate School  
of Saint Louis University in Partial Fulfillment of  
the Requirements for the Degree of  
Doctor of Philosophy

1992

## DIGEST

Even though eastern Indonesia has been the locus of many geological and geophysical studies, many geological aspects of this region remain poorly understood and have been the subjects of controversy. The Banda arc, which has a total curvature to nearly 180 degrees, is the most controversial feature. Whether this arc is a continuous subduction or a triple junction through subduction-subduction-transform fault system is strongly disputed. The subduction zone around Timor, continuity between Sunda and Banda arcs, arc-arc collision zone in New Guinea, and many others also remain in debate.

To reconcile those controversies, a seismotectonic study has been conducted by using a 23 year period of earthquake data reported by ISC, to expose the tectonic structure in the region. First, this structure is roughly defined from horizontal sections of the seismicity. Then, it is revised by using the vertical sections of the seismicity. By examining the earthquake focal mechanism solutions, this structure is further verified and is finally corrected.

A distinct subduction, where two plates meet and sink together into the mantle is indicated under the southern Banda arc, creating the deep Weber basin. This subduction, along with a subduction under the northern Banda arc and a transform fault (Tarera fault), has made up a triple junction. Another triple junction, through a three subduction system, is hypothesized

around Sumba. This system causes the signs of both continuity and discontinuity in the Sunda-Banda arc, and implies the occurrence of subductions to the north and south of Timor Island. Arc-arc collision with two opposite Benioff zones are found in Molucca Sea and New Guinea areas. The tectonic scheme in the New Guinea area seems to have have been changing recently, from transform fault in the west, southwestward subduction in the mid-western section, arc-arc collision in the mid-eastern section, and northward subduction in the east.