



The Sunda-Banda Arc Transition - First results from recent marine geophysical investigations offshore eastern Indonesia (Part 1)

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After the Indian Ocean Mw 9.1 earthquake and Tsunami from December 26, 2004, intensive research activities offshore northern and central Sumatra have contributed to an improved understanding of this part of the Sunda Arc subduction system, e.g. in terms of upper plate segmentation and outer arc high evolution. However, while a broad database is now available for this part of the Sunda Arc, the also highly active easternmost part of this subduction system, e.g. indicated by the south of Java Mw 7.7 earthquake and Tsunami from July 17, 2006, has remained almost unexplored until recently.

During RV SONNE cruise SO190 from October until December 2006, marine geophysical data have been acquired at the eastern Sunda Arc and the transition to the Banda Arc within the framework of the project SINDBAD (Seismic and Geoacoustic Investigations along the Sunda-Banda Arc Transition). The main goal of this project is to investigate the relation between the variability of the lower plate and the tectonic evolution of the overriding plate in terms of outer arc high formation and evolution, forearc basin development, and accretion and erosion processes of the overriding plate. The study area is especially eligible for these investigations since the subducting Indo-Australian Plate is characterized by rough topography where the Roo Rise is subducting off eastern Java and by smooth oceanic crust of the Argo Abyssal Plain off Bali, Lombok, and Sumbawa further to the east.

The forearc is responding to differences in the incoming oceanic plate with the absence of a pronounced forearc basin off eastern Java and with the development of the pronounced and deep (>4000 m) forearc Lombok Basin off Bali, Lombok, and Sumbawa. The eastern termination of the Lombok Basin is formed by Sumba Island, which shows evidence for recent uplift, probably associated with the subduction of the continental Scott Plateau. The Sumba area also represents the transition from subduction of the oceanic Argo Abyssal Plain underneath the eastern Sunda island arc to collision of the continental Australian Plate with the Banda island arc.

RV SONNE cruise SO190 was subdivided into two legs. During the first leg high-resolution multichannel reflection seismic and potential field data have been acquired, while the second leg was mainly attributed to the deeper structures utilizing wide-angle OBH/OBS measurements. We present preliminary results from the first leg of this expedition focussing on the geometry and evolution of the eastern Sunda forearc based on almost 5000 km of multichannel seismics, magnetics, and gravimetry profiles.

Acknowledgements

This project is funded by the Federal Ministry of Education and Research (BMBF) under grant 03G0190B. We thank Captain O. Meyer and his crew from R/V SONNE for their professional assistance during the cruise.