



Great Sumatran Earthquakes - MCS images and bathymetry offshore Sumatra- first results of SEACAUSE2 Leg 1 cruise SO186

S. Ladage (1), G. Gaedicke (1), Y. Djajadihardja (2) and SO186 SEACAUSE TEAM

(1) Federal Institute for Geosciences and Natural Resources (BGR), Hannover, Germany, (s.ladage@bgr.de), (2) Agency for the Assessment and Application of Technology (BPPT), Jakarta, Indonesia, (3) IFM-Geomar, Kiel, Germany, (4) Japan Marine Science and Technology Center (JAMSTEC), Yokosuka, Japan, (5) British Geological Survey, Nottingham, United Kingdom, (6) IORAS, Moscow, Russia (7) Lamont-Doherty Earth Observatory, New York, USA

The multidisciplinary SEACAUSE cruises with the German R/V SONNE addresses the Great Sumatran Earthquakes of December 26th, 2004 and March 28th, 2005. Main aspect of the project is to investigate the geological- and tectonic setting of the Sunda Arc offshore northern Sumatra in the vicinity of the earthquakes' epicenters. A major focus of the experiment is to identify, map and investigate major segment boundaries of the upper plate along which rupture propagation of the earthquakes seem to terminate. Methods employed to study the structural tectonics of the area are a multi-channel reflection seismic survey, wide-angle refraction seismic profiles to identify changes of the plate interface, passive seismic experiment deploying OBH and OBS, sea floor observation using TV sled, heat flow measurements and sediment sampling. Beginning in late 2005 the SEACAUSE experiment initiated with a swath bathymetric survey of the Sunda Arc. The survey covers large parts of the Sunda trench and slope offshore the outer-arc Islands of Simuelue, Nias and Siberut. It continues south-east to previous multibeam surveys carried out with the HMS-Scott (McNeal et al., Eos Trans. AGU, 2005), R/V Marion-Dufrene (Sibuet et al., Eos Trans. AGU, 2005) and R/V Natsushima (Won, Eos Trans. AGU, 2005). Additionally a set of OBS and OBH were deployed, crossing the segment boundaries of the Great Sumatran Earthquakes of December 26th, 2004 and March 28th, 2005. The OBS and OBH record the post seismic activity until recovery at the end of February 2006. In Jan-Feb. 2006 during

SEACAUSE 2 Leg 1 we carry out the multichannel reflection seismic survey of Sunda Arc off northern Sumatra. We use a 3000 m long digital streamer with 140 active channels, 2 ms sampling rate, 14 sec registration intervall. As source we employ a tuned array of 4 clusters with 2 GI-guns each. We will conduct up to 15 MCS - profiles across the subduction zone. Here we will present first images of this MCS survey combined with the swath bathymetry as well as gravimetric and magnitic surveys. These reflection seismic profiles are expected to reveal the structural architecture of the accretionary prism, the fore-arc and as well as part of the incoming plate and trench fill.