Geophysical Research Abstracts,
Vol. 10, EGU2008-A-02762, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-02762
EGU General Assembly 2008

Sea-surface temperature changes off Sumatra/Java and variations of the Indonesian Throughflow during the late Quaternary

H. Doose-Rolinski (1), A. Lückge (1), N. Westphal (1), M. Mohtadi (2) & C. Rühlemann (1)

(1) Federal Institute for Geosciences and Natural Resources, Stilleweg 2, 30655 Hannover, Germany (2) MARUM, University Bremen, Lobener Str., Germany (h.doose-rolinski@bgr.de)

The modern sea-surface temperature pattern off Sumatra and Java is strongly influenced by the monsoonal circulation. With the beginning of the boreal NW winter monsoon, when the ITCZ is located south of Java, the South Equatorial Current (SEC) deviates southward, and an eastward-flowing current develops along the coast off Java. In contrast, during boreal summer season the South Java Current and its prolongation the SEC flow westward along the coast off Java due to strong SE monsoonal winds generating coastal upwelling along Java/Sumatra. Du et al. (2005) have shown that the modern annual cycle of the Sumatra upwelling is tightly coupled with the strength of the Indonesian Throughflow (ITF) and its relationship to the monsoon system. Although upwelling off Sumatra exists (proved by high chlorophyll concentrations) during SE monsoon today, no major changes in the SST pattern were observed. One reason which explains this phenomenon is the transfer of large amounts of warm water from the Pacific to the Indian Ocean with the ITF during the SE monsoon season. In order to investigate the variability of the Sumatra/Java upwelling and the ITF in the past we will present reconstructed alkenone SSTs from sediment cores retrieved during RV SONNE cruises SO139 (1999), SO185 (2005) and SO189 (2006) along the coasts off Sumatra, Java and from the Timor Sea. Preliminary results show that average late Holocene SSTs of 28.1˚C (SO189-39KL) and 27.8˚C (SO139-74KL) deviate only slightly from modern annual mean temperatures ($<$0.5˚C) off Sumatra and Java. Within the past 25 ka, lowest temperatures of 25-26˚C were reached between

15 and 12 ka BP, which comprises the Bølling/Allerød and Younger Dryas periods. SSTs during the Last Glacial Maximum are 2.0˚C (northern Timor Sea), 1.6˚C (off southern Sumatra), and 0.6˚C (off northern Sumatra) lower than late Holocene values, respectively.