Geophysical Research Abstracts,
Vol. 10, EGU2008-A-06135, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-06135
EGU General Assembly 2008

New initiative on Paleotsunami Research in Northern Greece (Thermaikos Gulf)

K.R. Reicherter1, I. Papanikolaou2,4, S. Rössler1, D. Papanikolaou2, C. Grützner1, M. Mathes-Schmidt1 and G. Stamatis3

1 Inst. of Neotectonics and Natural Hazards, RWTH Aachen University, Germany, 2 Laboratory of Natural Hazards, National and Kapodistrian University of Athens, Greece, 3 Laboratory of Mineralogy and Geology, Agricultural University of Athens, Greece, 4 Benfield-UCL Hazard Research Centre, University College London, UK

Our Greek-German project involves the extraction and study of sediment cores from coastal deposits of the Thermaikos Gulf in Northern Greece, in order to identify paleotsunami deposits and to correlate them to the activity of faults from the North Aegean Basin. Recent offshore studies have underpinned the possibility of a tsunami generation that could affect the Thermaikos Gulf, caused by an activation of an oblique normal fault located in the western part of the North Aegean basin. The geodynamic framework in the study area is dominated by the western termination of the North Anatolian Fault Zone with steep normal faults with strike-slip, separated in several segments, which can host an M 7 earthquake associated with a vertical displacement of approx. 3 m (Papanikolaou and Papanikolaou, 2007). The Herodotus Histories report on a series of large waves and sea withdrawals occurring in 479 BC during the Greek-Persian war. Large portions of the Persian troops perished by drowning near Potidaea, western Chalkidiki peninsula (e.g. Papazachos and Papazachou,1989). Therefore, Herodotus's report is regarded as the first description of a historical tsunami (e.g. Bolt ,1978).

Our work concentrated on three localities along the eastern coast of the Thermaikos Gulf between Thessalonica and Chalkidiki peninsula. These areas are exposed towards the South, where the possible tsunami source is situated. Spit bars and lagunas serve as archives for tsunamites as their topography allows the conservation of a tsunami

record. Furthermore, we probed two sites on the western shore of the bay. About 200 m of cores were drilled during the field campaign in fall 2007, which have been analyzed and sampled in the lab (sedimentology, geophysical properties and micropaleontology). We have found several coarse clastic layers intercalated in fine-grained laguna deposits. Those have erosive bases, show fining-up and thinning up sequences, and include shell debris and rip-off clasts of laguna sediments. Multiple intercalations of these layers downhole are interpreted as either paleotsunamis of repeated earthquake activity or tsunami-like waves induced by submarine slides triggered by seismic shaking in the Thermaikos Gulf. This project aims to: a) to verify whether a tsunami occurred in 479 BC, b) to identify whether other unknown tsunami deposits can be traced in the Thermaikos Gulf coastal sediments, c) to assess the tsunami hazard, d) to assess the seismic hazard by calculating the recurrence interval of the oblique normal fault located in the southwestern part of the North Aegean Basin, indirectly through the tsunami recordings.

Acknowledgements: This work has been supported financially by the DAAD-IKYDA Project (Tracing tsunami deposits in the Thermaikos Gulf, Northern Greece. Implications for seismic and tsunami hazard and archaeology) and the RWTH Aachen University.

References: Bolt, B.A., 1978. Earthquakes. Freeman and Company, San Francisco, 241pp. Papanikolaou, I., Papanikolaou, D., 2007. Seismic hazard scenarios from the longest geologically constrained active fault of the Aegean. Quat. Int. , 171-172, 31-44. Papazachos, B.C., Papazachou, C.B., 1989. The Earthquakes of Greece. Ziti Publications, Thessalonica, 356p. (in Greek).