Geophysical Research Abstracts, Vol. 8, 09445, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09445

High resolution seismic surveys on Lake Balaton, central Pannonian basin

A. Horváth (1), P. Szafián (1), G. Bada (1), T. Tóth (2), F. Horváth (1), V. Spiess (3)

(1) Dept. of Geophysics, Eötvös L. University, Budapest, Hungary (e-mail: anita@pangea.elte.hu), (2) Geomega Ltd., Budapest, Hungary, (3) Dept. of Earth Sciences, University of Bremen, Germany

The Balaton basin was formed during the latest Pleistocene to Holocene, from 15,000 YBP onwards. Due to erosional processes, cca. 100-200 m of Upper Miocene sediments are missing, providing accumulation space for the formation of Central Europe's largest lake. The combination of climatic and tectonic effects resulted in changes of the drainage pattern leading first to the deposition of a series of coarse basal sediments followed by the formation of fine-grade silty strata at the bottom of the present-day lake. Water covered areas provide ideal environment to map the sedimentary architecture and tectonic structures with high resolution seismic profiling. During the last decade, we have acquired a wealth of high and ultra-high resolution seismic data using various recording configurations, all providing suitable data sets for detailed geological interpretation. The seismic appearance of the sediments below the lake bottom shows a characteristic pattern. Two major tectonosedimentary units are present. Seismic profiles revealed a gradual transition between the water and a soft, horizontally layered mud layer. Major portion of these lacustrine sediments is calcareous mud that has been deposited over the latest Pleistocene to Holocene (last 10-15000 years). The boundary between the mud layers and the Pannonian strata is a marked by a pronounced erosional and angular unconformity. Underneath this erosional surface, folded and faulted Pannonian delta sequences are imaged, which often show an intricate internal sedimentary structure reflecting the complexity of late Miocene depositional processes. Fine details of both the Holocene mud and the underlying Pannonian strata can be well studied in outcrop scale due to the ultra-high resolution of the method. Besides sedimentary features, seismic data allow a detailed analysis of neotectonic activity in the Balaton region as part of the structurally in-

verting Pannonian basin. The lake is aligned parallel with the Mid-Hungarian shear zone, a first-order tectonic element separating the two main tectonic units (ALCAPA and Tisza-Dacia) constituting the basement of the basin. Several branches likely connected to this fault zone have been repeatedly reactivated, as evidenced by the seismicity pattern in the area. It appears that traces of as young as Holocene to recent deformation events effected the lacustrine sediments. The ultra-high resolution seismic data allowed to depict the fine details of tectonic elements with an unparalleled accuracy.