Geophysical Research Abstracts
Vol. 12, EGU2010-5310-3, 2010
EGU General Assembly 2010


# Can we follow the neotectonic activity of the Hluboká-fault by reconstructing the evolution of the Vltava river course? - Mapping of fluvial terraces around the Budejovice-basin using historic maps

Dana Homolova (1), Johanna Lomax (2), Ivan Prachar (3), Petr Spacek (4), Andras Zamolyi (1,5), and Kurt Decker (1)

(1) Department of Geodynamics and Sedimentology, Center for Earth Sciences, University Vienna, Austria (dana.homolova@univie.ac.at), (2) University of Natural Resources and Applied Life Sciences, Vienna, Austria, (3) Energopruzkum Praha Ltd., Prague, Czech Republic, (4) Masaryk University Brno, Czech Republic, (5) Dept. of Geophysics and Space Sciences, Eötvös University, Budapest, Hungary

The Budějovice Basin in the Bohemian Massif (Czech Republic) is a fault-bounded sedimentary basin with a multiple subsidence history overlying Variscan crystalline basement. Permian, Cretaceous and Miocene sediments record repeated reactivations of faults at or close to the basin margin, which may have continued into the Quaternary. The latter is indicated by geomorphological features such as linear topographic scarps, which characterize part of the faults within and at the border of the Budějovice Basin. In a current study we assess possible Quaternary displacements along the faults delimiting the basin using geomorphological data, analyses of river planform patterns and correlations of Quaternary terraces of the Vltava River, which crosses the basin and its boundary faults.

The regionally most important tectonic feature – the Hluboká fault –forms the northeastern margin of the Budějovice basin. The fault crosses the course of the river Vltava, a fact that guided our research to take a more precise look at the character and distribution of fluvial sediments in this area. Our main focus is on dating of terrace bodies around the Hluboká fault. According to the scheme used in most European regions, influences by the Pleistocene glacial cycles, the Vltava river terraces were assigned by most scientists to the 4(5) main alpine glacial periods. This dating is not straightforward as terraces are not connected to moraine bodies like in the Alps. The terraces were basically correlated by their altitude above the river and by their lithology (clastic content and grain size composition), but mostly without any numerical age determination.

Our studies include several field and laboratory methods, supported by computer analyses of various types of spatial data. Data sources include: (i) modern topographic maps, (ii) geological maps, (iii) georeferenced historic map sheets of the Austrian Second Military Survey (provided by the Geoinformatics Laboratory of the University J. E. Purkyně, 2005). The georeferenced map sheets of the Second Military Survey provide a very exact base map (Timár et al., 2006) for investigating the location of possible terrace bases. Since the georeferencing accuracy is < 10 m, data from these map sheets can be integrated into the geomorphologic studies providing information about the geomorphologic situation in the study area of the years 1836-1842, i.e., with less anthropogenic impact on geomorphological features than today. These data sources are combined with data from boreholes and thus help us identifying potential terrace bodies and choosing appropriate investigation sites. In the field, morphological, sedimentological and pedological methods are used to obtain relevant data about the sediment stratigraphy. Several laboratory analyses were carried out to gain information on the age of the terraces. We use OSL-dating in combination with the analysis of heavy minerals and clay minerals, as well as grain size analysis. After gathering information about the absolute ages of the terrace bodies upstream and downstream the Hluboká fault, we may be able to declare if the building of terrace staircases was influenced by tectonic activity of the fault or not.

Timár, G., Molnár, G., Székely, B., Biszak, S., Varga, J., Jankó, A. (2006): Digitized maps of the Habsburg Empire - The map sheets of the second military survey and their georeferenced version. Arcanum, Budapest, 59 p.

ISBN 963-7374-33-7