Geophysical Research Abstracts,
Vol. 11, EGU2009-2016-1, 2009
EGU General Assembly 2009

Morphometric analysis of the Koros drainage basin (Hungary/Romania) using historical topographic maps

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The Körös River drainage basin is located in the eastern part of the Great Hungarian Plain, west of the Apuseni Mts., in the middle of the Pannonian Basin. The channels of the river and its tributaries are mostly meandering. The channel sinuosity of this river system is analyzed in order to draw conclusions on the neotectonic activity of this area.

The meandering rivers can demonstrate changes, which occurred recently, and cannot be seen with other methods. The changing sinuosity indicates the location of the vertical movements of the surface. The sinuosity calculations were made on the natural, uncontrolled riverbeds. These beds were digitized from the maps of the Second Military Survey of the Habsburg Empire, which were measured before or during river control implementation. Digitized features were made on the geo-referred maps, which are in the Hungarian National Grid (EOV) coordinate system. The estimated accuracy of the map sheets to the modern system is 50-100 m, but the accuracy in Hungary remains under 30 m.

In the study area, we identified several points of sinuosity change. To prove, that these are of neotectonic origin, seismic sections crossing the study area, were also analyzed. Five fault lines are indicated to be neotectonically active according to the river planform changes. Activity of two of these five faults, and the subsidence in-between them caused the formation of the Nagy-Sárrét marshland. A Romanian river section, characterized by anastomosed planform, instead of meandering, indicates recent activity of another fault.