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Investigation of watercourses by comparison of successive historical map surveys of Western Hungary

Gábor Kovács (1,2)

(1) Institute of Geography and Earth Sciences, Eötvös Loránd University, Budapest (s_kovacs_gabor@hotmail.com), (2) Department of Cartography and Geoinformatics, Eötvös Loránd University, Budapest

The Second (Timár et al., 2006) and Third Military Survey (Biszak et al., 2007) of the Habsburg Empire, completed in the 19th century (1806-69 and 1869-87), can be very useful in different scientific investigations because of their accuracy and data content. The mapmakers used geodetic projections and survey technologies provided high accuracy. Therefore, scientists can use these maps and the represented objects in retrospective studies. The streams were drawn with very thin lines that also ascertain the high accuracy of their location.

Previous study used the Second Military Survey to examine the neotectonic evaluation of the western part of the Pannonian Basin, bordered by Pinka, Rába and Répce Rivers (Kovács, 2010). The watercourses, especially alluvial ones, react very sensitively to tectonic forcing (Schumm & Khan, 1972; Ouchi, 1985). However, the present-day course of the creeks and rivers are mostly regulated, therefore they are unsuitable for such studies. The watercourses have reconstructed from maps surveyed prior to the main water control measures. The Second Military Survey was a perfect source for such studies. The investigated streams were free meandering ones. They could flood their banks, and only natural levees were present. After georeferencing the maps of the area, the streams were digitized, and their sinuosity values were computed. Where significant sinuosity changes have been detected along the streams, it can be considered as indicators of differential uplift or subsidence of the bedrock/alluvium.

The goal of this study is to decide the character of several stream sections: were they free meandering ones or not? Some of the sections are antecedent ones, especially at the Vas Mountain at the present Austrian-Hungarian border. If the shapes of the watercourses on the different surveys are almost the same, the sinuosity refers to a prior, forced state of the stream. After digitizing the watercourses on the Third Military Survey sheets, some newly regulated sections are recognized as well as forced and free meandering ones. Thus, the neotectonic evaluation of the study area can be made more accurate.

References

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