



High-resolution digital elevation model and historical topographic maps of the Tisza River floodplain, the Great Hungarian Plain

G. Timár (1) and J. Mészáros (2)

(1) Eötvös University of Budapest, Dept. of Geophysics and Space Science, Budapest, Hungary (timar@ludens.elte.hu, +36 1 3722927), (2) Dept. of Cartography and Geoinformatics, Eötvös University of Budapest, Hungary

The Great Hungarian Plain (GHP), the central part of the Pannonian Basin, is one of the world's most developed flatlands. The relief differences remain under 20 meters in the central area of the plain, especially in the wide floodplain of the Tisza River. After the flood control measurements of the river (1846-1930), newly built dykes cut the wider floodplain from the actual narrow floodway. Common knowledge of the historical inundation patterns has been almost lost. To obtain pieces of information about the possible flood extents, usage of high-resolution elevation models is a valuable option, as well as application of rectified historical topographic maps.

The best available elevation model of the GHP is based on the vectorized 1:10,000 scale topographic maps of the Institute of Geodesy, Cartography and Remote Sensing of Hungary (FÖMI). The base contour interval is 1 meter but according to the very flat characteristics of the area, halving contours are commonly used. This contour density is definitely needed to get better elevation models than the one of the SRTM, which shows only the general features of the flatland with remarkable errors at the forests.

Historical topographic datasets, such as the ones compiled directly for the water control measures (triangulation: 1833-34; mapping until 1842 by Sámuel Lányi), as well as the First (1783-86) and Second (1857-61) Military Surveys can be rectified easily after understanding their geodetic basis. They show in surprising precision the fine vertical structure of the river terraces and the historical inundation levels. These cartographic elements are of great value also for the necessary re-assessment of the flood control system.