

High Precision GNSS-GIS DEM to Improve Model Inputs in Catchment Studies

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The reduction of nutrient loss of surface and ground waters at a watershed level is an important issue. For this aim, the use of up to date GNSS-GIS (Global Navigation Satellite Systems – Geographic Information System) device systems is essential. In the present days, GIS systems in a wider sense give the background to applied research. Further devices connected to GIS systems, such as remote sensing, mobile communication, 3D modelling, geodesy and image processing, ensure further opportunities in research. Another important task is to create modern, relevant databases and spatial data systems with adequate structure for easy access and efficient use. Partly we can rely on the results of INSPIRE (Infrastructure for Spatial Information in Europe). An important base to count on throughout research is a high precision elevation or terrain model. Most of the cases, this does not exist with adequate precision for a certain area, so the generation of a model is unavoidable. For a big area, remote sensing gives an adequate solution. For smaller areas, parts of watersheds, however, a geodesic accuracy, RTK (Real Time Kinematic) topographic GNSS survey can give a more efficient and flexible solution. For all these modelling tasks, a useful device can be obtained using the terrain correction systems (GBAS) integrated into GNSS. It is important that the model should contain the terrain objects as well. Thus a high precision terrain model can be created in the most widely used formats.

The present article introduces the results of our GNSS survey and model generation carried out in Research Institute for Viticulture and Oenology, Badacsony, Hungary (~10 ha). The area is highly structured, and stripped, suitable for outflow modelling. The survey was carried out in the spring of 2010. using the GIS-GPS infrastructure of the Georgikon Faculty of the University of Pannonia, Keszthely, Hungary.