



Implications on small-scale incision and deposition in a deeply incised gorge of the Visegrád Hills (Hungary) from repeated levelling

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The Tertiary volcanic Visegrád Hills together with their counterpart the Börzsöny Hills form the spectacular geomorphic feature of the Danube Bend in the northern part of Hungary. The area is relatively rapidly uplifting, consequently the Danube incised progressively in the volcanic edifices (proven by in situ cosmogenic age dating). Our original idea was to test the hypothesis whether this incision can be depicted in the long-profile of a tributary of the Danube and if active faulting can be implied from the data.

In order to get a high resolution long-profile of the tributary Rám Creek levelling has been initiated. However, due to the extremely wet meteorological conditions in 2010, a high-precipitation event in April 2010 impeded our activity. Due to the high discharge in the gorge and the danger of falling loosen trees the access has been restricted to the area for several weeks by the Directorate of Pilis Forest Management Ltd.

The completed long-profile has been analysed using stream length-gradient index (SL index). Furthermore we compared the before–after curves as well. (Unfortunately only a short section was measured prior the meteorological event.)

Small-scale changes were observable both in the long-profile and in the course of the creek. At places some few decimeters of new deposits accumulated in the form of debris cones, while in the lower sections of the creek meandering bends have been slightly modified.

In general, the long-profile seems to be largely in equilibrium except for some shorter sections, where increased SL-index values were detected. These sections partly can be related to slight lithological changes, but active tectonic contribution may also be assumed. Prominent geomorphic features like small waterfalls are also included in these sections.

The contribution of transported sediment load includes products of small scale mass movements like soil creeping, small landslides, etc. The material falling in coming from the side walls this way may also influence the fluvial course and pattern. In order to have a better control on the elevation variation and slope conditions of the catchment and to verify the possibility of on-going activity, high resolution DEM creation has been initiated. However, because of the difficult conditions in the deeply incised gorge (high walls, falling rocks, etc.), realistic and space-filling elevation data can only be gathered by remote sensing techniques. The data acquisition is about to be completed in the near future.