



## **Dendrochronological and GIS methods in monitoring areal erosion - Bábaapáti, Mecsek Hills, Hungary**

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An application of dendrochronological methods is the measuring of slope degradation. The measured decline rates are integrated to a complex digital terrain model (DTM) including elevation data and land cover in order to make an erosion map. Analysis of growth-rings of tree roots is applied to estimate the time of the exhumation of the root. Two types of observations are applied to identify the exposure time of the root: (1) Since the first ring of a root can only grow under the surface, the number of the tree rings of a living root defines the maximal age of the exhumation; (2) The uncovered roots can be damaged after they have been uncovered. The age of a damage of the cambium also can be measured by the counting the number of overgrown tree-rings, which defines the minimal age of exhumation. The dendrochronological data limits the rate of the slope decline. Measurements have been carried out in the Nagymórág Valley near Bábaapáti, South Hungary. Measured ages of 82 exhumed roots range from 4 years (newly grown) to 42 years. 0.07-1.08 cm/y slope decline rates were calculated. A digital elevation model (DEM) was created from contours of 1:10,000 topographic maps by kriging, and a slope angle map was derived. Analysing the measured slope decline data a relation was revealed between the slope angle and the decline rates (correlation=0.36). Based on the regression equation of these datasets an erosion map is derived from the slope map.

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