Multi-proxy analyses of subatlantic peat bog sediments from the Western Tatra Mts. (Poland)

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The main aim of our study was to analyse local slope processes, vegetation changes and human impact during the last millennium in the Pyszniańska Valley (Western Tatra Mts.) on the basis of palynological and lithological analyses combined with radiocarbon datings from a small peat bog in the Pyszniańska Valley. These data were supplemented by a lithological analysis of cirque bottom-slope deposits from a depression within the Pyszniański cirque. Sedimentation at the site probably began in the 14th-15th century, which is suggested by pollen analysis. The sediments are dominated by fine grain material (sands and silts) transported by surface and linear slope washing with the interbedding of distinctive layers of coarse clastic material, which are indicators of high-energy geomorphic processes. The first phases of vegetation development (TZNP-1,2 zones) are characterized by visible deforestation caused by fire clearances and/or development of mining and metallurgical centers. The high number of hazel (*Corylus avellana*) pollen grains is probably the effect of the redeposition of sediments originating in the Boreal or Atlantic period from the higher elevation of the valley. In the TZNP-3 zone the Pyszniańska Valley was affected by a most catastrophic high-energy geomorphic event, recorded as a continuous layer of coarse material. The upper phase (TZNP-4a subzone) signifies pasture development based on animal husbandry. Regular determination of *Ambrosia artemisifolia* type pollen combined with radiocarbon data points to the 19th-20th century. The TZNP-4b subzone reflects the succession of *Carex rostrata* on the peat bog and reforestation in the vicinity of the site caused by the establishment of the Tatra National Park in 1954. The cirque floor sediments consist of massive, 1.65 m thick, very coarse layers of gravels and boulders, which represent dynamic sedimentation caused by the activity of high magnitude slope processes (debris flows).

Decision support system for landslide hazard mitigation on rock slopes

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Slope movements on the rock slopes (e.g. rock falls or rock slides) belong among the most dangerous slope processes since even small volume events (involving single boulders) may have largely damaging effects on infrastructure or may cause serious injuries. This phenomenon is very often also highly localized problem, which demands for local solutions by local governments which rarely include experienced personnel. Rather high costs of almost any structural mitigation measure possibly applied on rock slopes makes mitigation process subject to many political and economic interests which not always result in the best and most effective slope stability solution. The project NEMETON aims to provide easy to use and free web based tool for local authorities and also for project companies to provide basic information about degree of hazard, possible mitigation measures and their basic technical and economic characteristics. The system includes interactive interface for intuitive description of rock slope stability problem allowing even inexperienced user to provide sufficient information to be advice for future steps leading to cost effective solution of the problem. At the same time, the basic information will help the project and technical companies to get a basic idea about probable cause of the problems, possible slope stability solutions and the technical conditions of the solution. In the second step, more detailed