Reconstruction of the network of former mining roads in the Polish part of the Tatra Mountains based on data from airborne laser scanning (ALS)

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A dissertation abstract

This study aimed to reconstruct the network of former mining roads in the Polish Tatra Mountains and identify the causes for the various degree of their preservation. The study focuses on the roads that have been excluded from general use and are subject to natural decay.

Using airborne laser scanning (ALS) data, a detailed shaded model of the study area was constructed, in which legible traces of the mining road network were vectorized based on archival and contemporary cartographic sources and field research. A database of homogeneous road sections (RS) was created, which were assigned attributes related to e.g. their location in relation to the main landforms. RS lengths, longitudinal profile drops, absolute elevations, inclinations and slope aspect were calculated. The RS were assigned to five classes of their legibility degree on the shaded terrain model; they were defined according to the proposed detailed criteria.

The features and attributes of RS related to their readability classes on the terrain model were used to infer about the causes for the varied state of preservation of the mining roads. The study also identified previously unknown sections of mining roads in the Polish Western Tatra Mts., confirming the applicability of ALS method is in studies of inaccessible or protected areas, especially in the case of identifying anthropogenic microforms.