PROCEDURE FOR GRAVITY FIELDS DETERMINATION BY FOREST OPERATION PLANNING

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ABSTRACT:

In this paper, an algorithm for the simulation of the determination of gravity fields used by forest operation planning and its application is presented. The origin of procedure is in the identification of ridge points using Digital Elevation Model (DEM) data. Ridge points contribute to the accuracy of gravity field delineation. The procedure of gravity field delineation uses a raster GIS module for the simulation of movement through space, where frictions impede that movement.
The IDRISI GIS software and its module ALLOCATE was used, which assign each raster cell to the nearest of a set of designated features – in our case, an individual forest road. In each set of raster cells, the closest road is chosen. The distance could be affected by different types of frictions. Friction is determined by the slope, terrain and forest stand condition. The terrain ridges designate points with a high value of friction that can impede the movement (skidding) of timber. The paper presents a sample calculation of road charges by extracted wood volumes in a real mountainous forest management unit with an area of 3000 ha and 80 km of forest road network. The road charges are expressed by cubic meter of wood per current road length (1m). The forest road charge data could be used for estimations of forest openness, costs of road maintenance, quality demanded and other factors.