

Určenie koeficientu hydraulickej vodivosti pôdy v horskom povodí pomocou zrnitostných rozborov a terénnych meraní

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Anotácia

V povodí Jaloveckého potoka boli na 38 lokalitách merané koeficienty hydraulickej vodivosti povrchu pôdy pomocou minidiskového infiltrometra. Merané hodnoty boli porovnané s hodnotami vypočítanými pomocou vzorcov vychádzajúcich zo zrnitostného zloženia pôdy. Merané aj vypočítané hodnoty hydraulickej vodivosti boli porovnané s maximálnymi hodinovými intenzitami zrážok. Z výsledkov vyplýva, že v povodí je len zriedkavo splnená podmienka pre vznik povrchového odtoku.

Kľúčové slová: hydraulická vodivosť pôdy, malé horské povodie, intenzita zrážok

Annotation

The hydraulic conductivities at 38 sites in Jalovecky creek catchment were measured. For the measurements we used mini disc infiltrometer. Measured values were compared with values calculated using soil texture equations. Both measured and calculated were compared with highest rainfall intensities. Results shown, that surface runoff occurs rarely in the catchment

Key words: hydraulic conductivity, small catchment, rainfall intensity

Abstract

DETERMINATION OF SOIL HYDRAULIC CONDUCTIVITY IN THE MOUNTAIN CATCHMENT BY SOIL TEXTURE AND FIELD MEASUREMENTS

Hydraulic conductivity of soil surface was measured at 38 sites in the Jalovecký creek catchment by the minidisc infiltrometer. Mean hydraulic conductivity of soils in the mountain part of the catchment (130 mm.h^{-1}) is significantly higher than the one in the foothill part of the catchment (33 mm.h^{-1}), but it has bigger spatial variability as well (although the coefficients of variations are similar). Measured values were compared with the values calculated from the formulas based on soil texture. Calculated values are in many cases similar (within an order of magnitude) to the measured ones. However, the maximum differences between the measured and calculated values are similar to the differences in the hydraulic conductivity among different sites in the catchment. Field measurements of soil hydraulic conductivity in our mountains are not so common. The measured values show that high hydraulic conductivity of soils in the mountain part of the catchment (the Western Tatra Mountains) exceeds 100 mm.hod^{-1} at one half of the sites. At a few sites the water during the measurement did not infiltrate. However, the infiltration started after a slight wetting of the soil surface and the measured hydraulic conductivity significantly increased. Measured and calculated values have been compared with maximum rainfall intensity data from years 2001 - 2011. The results shown, that rainfall intensity exceed hydraulic conductivity very rarely. So the conditions for surface runoff generation are very rare.

Key words: hydraulic conductivity of soil, small mountain catchment, the Western Tatra Mountains, variability