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VULNERABILITY OF GROUNDWATER UNDER CLIMATE CHANGE AND LAND COVER: A NEW SPATIAL ASSESSMENT METHOD APPLIED ON BELIȘ DISTRICT (WESTERN CARPATHIANS, ROMANIA)

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Abstract

A new assessment method of groundwater vulnerability was done using multilayer data analysis through GIS Spatial Analyst Tools. The method presented here refers at Beliș district territory and describes two tasks: (1) groundwater vulnerability determination from Water Surplus, Ecosystem Services, Aquifers map, and Infiltration map; (2) the future vulnerability assessment for 2050, considering four scenarios of land cover and climate data changes. First results, carried out by proposed method, show a very high vulnerability area of 2.44 km² and a high vulnerability area of 24.09 km² in Beliș district. The projections of land cover and climate data came to estimate the vulnerability of groundwater in 2050. Thus, the area of 3.02 km², with highest vulnerability was found in scenario 2, under localities area increase and precipitation decrease. The findings demonstrate that both climate change and land cover are responsible for groundwater vulnerability. Further, the vulnerability mapping and land cover scenarios could be useful for delimitations of protected areas and development of plans' management.

Key words: climate change, GIS method, groundwater vulnerability, land cover, vulnerability

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