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Assessing the Role of Snow Water Equivalent on the Spring Hydrological Regime of Șușița River (Romania) Using SMA Hydrological Model in the Context of Climate Change

Nicu Ciobotaru (1,2), Gyorgy Deak (1), Liliana Zaharia (2), Monica Matei (1), and Lucian Laslo (1)

(1) National Institute for Research and Development in Environmental Protection, Climate Change and Sustainable Development, Romania (lucianlaslo@yahoo.com), (2) University of Bucharest, Faculty of Geograph, Department of Meteorology and Hydrology

This paper aims to assess the role of the snow water equivalent (SWE), on the genesis of the spring high waters within the Șușița catchment (370 km2), located in eastern Romania, between Carpathian mountains and Romanian Plain. The analysis is performed with HEC-HMS software by using Soil Moisture Accounting (SMA) loss method coupled with the SCS Unit Hydrograph transformation method and Muskingun-Cunge routing method. The data used to reproduce the physical condition of the Șușița catchment are referring to: soil hydraulic properties, surface and canopy water retention capacity.The climatological data from the five meteorological stations surrounding the Șușița catchment on temperature, rainfall and evapotranspiration are the input for the Temperature Index climatic model. The input parameters of the physical model are calibrated with the daily discharges recorded at Ciuruc gauging station (1971-2010), therefore the ground water coefficients and water excess parameters being optimized to confidently reproduce the observed discharges. The results refers to SWE role in spring high water formation by the snow rate melt regime. In the context of temperature increase in the study area, which is about 1°C between 1971-1980 decade and 2001-2010 decade there has been observed a reduction of the number of days with snowpack and in its consistency during cold season, HEC-HMS SMA model being a useful tool in studying climate change impact upon catchments functionality.