



Recent development of continuous gullies from Barlad Plateau, Romania

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Located in the eastern Romania and extending on 8200 km² the Barlad Plateau is considered the most typical subunit of the Moldavian Plateau. The sedimentary Miocene-Pliocene clay-sandy layers, inter-bedded with shallow sandstone and limestone are gently dipping toward S-SE as homoclinal structure. There are also Quaternary formations, including a loess blanket. The Plateau comprises three major subunits: the Central Moldavian Plateau (CMP) in the north, the Tutova Rolling Hills (TRH), west of the Barlad Valley, and the Falciu Hills (FH), east of the Barlad Valley. Land degradation through gullying represents an important environmental threat in the region, especially around the town of Barlad within TRH and FH.

By using both the classical research methods such as repeated field surveys (intensive monitoring between 1978 and 2003 using the "stakes grid method" and long-term stationary monitoring of gully growth using repeated leveling), aerial photographs (the ones taken in 1960, 1970, 2005, 2009, and 2012) and the present-day methods based on the GIS software it was possible to precisely evaluate the development of continuous, valley-bottom gullies since 1960.

Linear gully head retreat, areal gully growth and eroded material rates were quantified for two 30 year periods (1961–1990 and 1991–2018). Results have indicated that the gullying peak occurred during 1960s than gully erosion rates have decreased, but still remain problematic in places. This gullying decline is due to the rainfall distribution combined with the increased influence of soil conservation practices over the first period (1961-1990) and combined with the land use changes during the second period (1991-2018).