



Recent and future rainfall erosivity on the territory of the Czech Republic

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Water erosion is a main factor of degradation of soils used for agriculture in the Czech Republic. For landscape conservation purposes the soil erosion risk is defined here mostly by USLE (Wischmeier and Smith, 1978). Within USLE the precipitation impact on erosion is a function of rainfall kinetic energy and intensity represented by R-factor. In the Czech Republic historically and recently several research teams have analyzed rainfall data to assess R-factor. Till now not many European countries have performed detailed spatially distributed analyses of rain erosivities. Most studies use only simplified methods based on long-term rainfall averages or databases of only several station-datasets.

The most recent study on rainfall erosivity spatial distribution over the Czech Republic was based on digital rain gauge data from automatic stations of the Czech Hydrometeorological Institute. The erosive rains were derived from continuous 1 minute step 10-year rainfall data (2003-2012) from 245 stations. Based on the research recent annual R-factor values in the stations vary from 37 to 239 [N.h^{-1}] (values over 100 are located in mountain regions with minimum of agricultural land). Average value is 69 [$\text{N.h}^{-1}.\text{year}^{-1}$].

For the Czech Republic the future prediction is based on 10km resolution ALADIN/CZ regional climate model. Within the EU FP6 project CECILIA it was coupled with GCM ARPEGE to provide a projection of future climate in two time slices, 2021-2050 and 2071-2100, according to the IPCC A1B emission scenario. Daily precipitation volumes and percentiles of maximal events allowed authors to develop R-factor maps of present and future scenarios. Based on the analyses we can conclude that average value for the whole territory of the Czech Republic will remain close to 70 [$\text{N.h}^{-1}.\text{year}^{-1}$] or even decrease for 2071-2100, but we can expect significant changes (30-40 % rise or decrease) for several large agricultural regions (eg. Southern Moravia). These changes will have impact on soil erosion dynamics of the specific areas. Details on the spatial distribution of recent and future rain erosivities over the Czech Republic and the consequences for the erosion risk will be presented.

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