Geophysical Research Abstracts
Vol. 19, EGU2017-10892, 2017
EGU General Assembly 2017


# Quantitative Analysis of Relevant Soil, Land-use and Climate Characteristics on Landscape Degradation in Hungary

Adam Kertesz (1,2), Janos Mika (2), Gergely Jakab (1), and Melinda Palinkas (3)

(2) Eszterhazy Karoly University of Applied Sciences, Eger, Eger, Hungary (mikaj@ektf.hu), (1) Research Centre for Astronomy and Earth Sciences Hungarian Academy of Sciences, Geographical Institute, Budapest, Hungary, (3) Saint Stevens University, Godollo, Hungary

The objective of our research is to survey degradation processes acting in each micro-region of Hungary in connection with geographical and climatic characteristics. A survey of land degradation processes has been carried out at medium scale (1:50 000) to identify the affected areas of the region. Over 18,000 rectangles of Hungary have been digitally characterised for several types of land degradation. Water-flow type gully erosion and soil-loss (RUSLE, 2015: Esdac-data) are studied for dependent variables in this study. USDA textural classes, available water capacity, bulk density, clay content, coarse fragments, silt content, sand content, soil parent material, soil texture, land-use type (Corine, 2012) are used for non-climatic variables.
Some of these characteristics are quantified in a non-scalable way, so the first step was to arrange these qualitative codes or pseudo-numbers into monotonous order for including them into the following multi-regression analyses. Data available from the CarpatClim Project (www.carpatclim-eu.org/pages/home) for 1961-2010 are also used in their 50 years averages is seasonal and annual resolution. The selected variables from this gridded data set are global radiation, daily mean temperature, maximum and minimum temperature, number of extreme cold days (< 20 C), precipitation, extreme wet days (>20 mm), days with utilizable precipitation (>1mm/d), potential evapotranspiration, Palmer Index (PDSI), Palfai Index (PAI), relative humidity and wind speed at 10 m height. The gully erosion processes strongly depend on the investigated non-climatic variables, mostly on parent material and slope. The group of further climatic factors is formed by winter relative humidity, wind speed and all-year round Palmer index. Besides leading role of the above non-climatic factors, additional effects of the significant climate variables are difficult to interpret. Nevertheless, the partial effects of these climate variables are combined with future climate scenarios available from GCM and RCM studies for Hungary. The real climate change effects may likely be stronger, than those obtained by this combination, due to inter-dependences between the non-climatic factors and climate variations. The study has been supported by the OTKA-K108755 project.