Seasonal Differences in Rainstorms between Sites in Austria and Southeast USA

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Soil erosion by water is worldwide the major threat to the resource soil. It is mainly driven by rainfall erosivity which is affected by the amount and intensity of the rainfall. For assessing the erosion risk of an area the knowledge about the occurrence of the event as well as the temporal distribution within this rainstorm is essential.

Objective of this study was to compare rainfall events of two sites in Austria and the Southeast US and to investigate the temporal and seasonal variability of these rainstorms throughout the year. Mistelbach is located in the north-eastern part of Austria with an average annual precipitation of 650 mm. The US site was Tifton, GA, with an average annual rainfall of 1220 mm.

For approximately 150 rainstorms exceeding 5 mm the amount, duration and temporal distribution of each storm were analyzed for each site. Analyses were performed using Huff curves where duration and accumulated amount for each storm are displayed dimensionless. This method enables to illustrate the frequency distribution of the temporal course of precipitation events. The influence of different seasons was determined by investigating the events occurring in February-April, May-July, August-October and November-January.

The results showed that rainfall erosivity in the US was much higher than in Austria. At both sites high seasonal differences in rainfall events existed. Highest intensity rainfalls leading to highest erosivity occurred from May to July while events with lowest intensity were observed during winter from November to January.

With this method temporally distributed rainfall events with different amounts and durations can be generated. These so defined "design" storms can then be used as climate input for physically based soil erosion models. The erosion risk or the protection efficiency of a given land/soil management system can then be evaluated for a specific heavy rainstorm with a given occurrence.

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