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# Contribution and occurrence probability of extreme soil erosion events: Linking plot experiment and long term rainfall data

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Erosion plot monitoring enables the quantification of local rainfall erosive forces and soil erosion - but the lack of extreme event records impedes the assessment of extreme event contribution to long term average annual soil loss. In this research erosion plot data of two Austrian sites (Mistelbach, Lower Austria, and Pixendorf, Lower Austria) was linked to long term rainfall data to 1) relate rainfall erosivity (EI30) to soil erosion, and 2) to assess soil erosion by its occurrence probability (T). Regression models were fitted to logarithmic scale rainfall erosivity and soil erosion data, and Generalized Extreme Value distributions and Pareto Distributions were fitted to long term rainfall erosivities. Occurrence probability of various rainfall erosive events was assessed and long term average annual soil loss was estimated for both sites by integrating the event based soil loss over the annual exceedance probability (1/T). The link of event based soil erosion and occurrence probability enables the identification of the dominant events: Soil erosion in Pixendorf is dominatingly affected by erosive events of less than 20 years of return period as contribution of increasing return period events is progressively reduced through low annual exceedance probability. In Mistelbach soil erosion of unfrequent extreme events overcomes the effect of decreasing occurrence probability and consequently contribution of extreme erosive rainstorms is large. This study identified variable contribution of extreme erosive events to soil erosion - potential use and limitations of this procedure will be discussed at the conference.