



Separation of rill and interrill erosion by qualitative and quantitative measurements in the field

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In a number of publications, the processes of interrill and rill erosion at the hillslope scale are associated with erosion dominated by raindrop splash and surface runoff, respectively. The dominating process may change with rainfall characteristics. In this study we present a field measurement concept to discriminate between both processes. Sediment and water discharge is measured on a small erosion plot (1 m²) to quantify interrill erosion and simultaneously on a hillslope (300 m²) as a measure of both rill and interrill erosion. Additionally, laser scans are used to monitor small areas containing rills within the hillslope area. The multi-temporal comparison of the laser-scan images illustrates the dominating process during the observation periods. Finally, correlations between measured sediment, amount of rainfall, rainfall intensity and runoff volumes are analyzed for each period. In total, 6 observation periods of 2 to 6 weeks duration, starting in May 2005 until November 2005, were analyzed on a vegetation-free sandy hillslope in eastern Germany. Depending on the rainfall intensity, the dominating process in the study area tends to change: for low intensity events splash erosion on the interrill area dominates while during high intensity events which produce considerable runoff volumes rill erosion dominates. The agreement of the different approaches to separate the dominated process is quite satisfactory. This technical setup can be useful for improving improving of the knowledge of the erosion processes in the field. Using more frequent measurements single erosive events can be analyzed.