



Comparison of different methods to calculate total runoff and sediment yield based on aliquot sampling from rainfall simulations

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The quality of data obtained by rainfall experiments depends mainly on the quality of the rainfall simulation itself. However, the best rainfall simulation cannot deliver valuable data, if runoff and sediment discharge from the plot are not sampled at a proper interval or if poor interpolation methods are being used. The safest way to get good results would be to collect all runoff and sediment amounts that come off the plot in the shortest possible intervals. Unfortunately, high rainfall amounts often coincide with limited transport and analysis capacities. Therefore, it is in most cases necessary to find a good compromise between sampling frequency, interpolation method, and available analysis capacities.

The aim of this study was to compare different methods to calculate total sediment yield based on aliquot sampling intervals. The methods tested were (1) simple extrapolation of one sample until next sample was collected; (2) averaging between two successive samples; (3) extrapolation of the sediment concentration; (4) extrapolation using a regression function. The results indicate that all methods could, theoretically, be used to calculate total sediment yields, but errors between 10-25% would have to be taken into account for interpretation of the gained data. Highest deviations were always found for the first measurement interval, which shows that it is very important to capture the initial flush of sediment from the plot to be able to calculate reliable total values.