

## **Usefulness of Kinetic Energy as a predictor of Rainfall Erosivity and Sediment Yield in a Small Catchment In Southern Brazil**

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The rainfall erosivity index ( $EI_{30}$ ) developed and commonly used to predict soil loss in the continental USA is being regularly used in Southern Brazil where the rainfall characteristics are significantly different. This study aimed to carry out an analysis of the relationship between rainfall characteristics (kinetic energy, intensity etc.) with the sediment yield from a small rural catchment (19.1 km<sup>2</sup>) located in southern Brazil where intensive land use with tobacco cultivation has caused high rates of erosion and sediment yield. The results showed that the predictive ability of the kinetic energy exceeded that of the rainfall intensity in explaining the variability of erosion and sediment delivery from the catchment. Furthermore, the paper explores the seasonal variations of these relationships and the differences in the magnitude of the events. The paper also proposes an alternative equation for estimating kinetic energy from precipitation intensity and provides a comparison with previous equations like the one proposed by Wischmeier & Smith (1958) and other regional equations. Finally, the paper discusses the need for monitoring the kinetic energy in erosion studies at the catchment scale, in order to successfully predict erosion and sediment yield outcomes.