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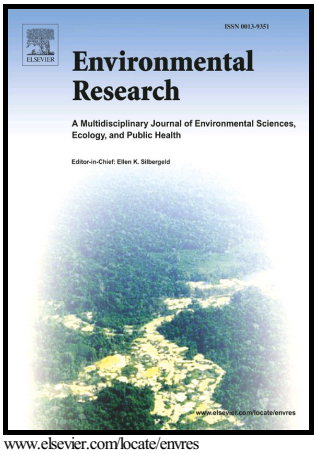

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A simple model for estimating changes in rainfall erosivity caused by variations in rainfall patterns

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Abstract

A major challenge when coupling soil loss models with precipitation forecasts from Global Circulation Models (GCMs) is that their time resolutions do not generally agree. Precipitation forecasts from GCM must be scaled down; however, the distribution of the rainfall intensity, which can affect soil loss as much as precipitation amounts, is usually not considered in this process. Therefore, the objective of this study was to develop a statistical equation for computing event-based rainfall erosivity under changing precipitation patterns using the least amount of information possible. For this purpose, an empirical equation for predicting event-based rainfall erosivity was developed using the product of the total precipitation P and the maximum 0.5-h rainfall intensity, $I_{0.5}$. This equation was calibrated using measured precipitation data from 28 sites in Central Chile and then tested with simulated data with different rainfall patterns from the CLIGEN (CLImate GENerator) weather generator. More than 53,000 rainfall events were analyzed, where the equation consistently provided R^2 values of 0.99 for every dataset used,