



Mapping rainfall erosivity for Africa with TRMM time series

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Remote sensing data offer important information about biophysical parameters at various spatial and temporal scales. Soil erosion by water is a function of many of these parameters. Regrettably, practical use of remote sensing in soil erosion research is mostly confined to mono-temporal vegetation mapping. We argue that information from space-borne missions can be more effectively used in erosion mapping and monitoring worldwide. For that appropriate spatial and temporal scales should be selected which reflect the dynamics triggering erosion. Coarse spatial scale data can provide important information at a fine temporal resolution, especially because erosion is an erratic phenomenon often linked to high rainfall-intensity events. Both rainfall and vegetation cover are highly dynamic factors affecting erosion. To illustrate how the erosion community could better make use of currently available time series of space-borne missions, we create monthly and yearly rainfall erosivity maps for the African continent from TRMM (Tropical Rainfall Measurement Mission) rainfall estimates. Currently most large-scale erosivity maps have been based on extrapolated gauge data and monthly or yearly rainfall, often using generalized empirical formulas. TRMM 3B42 data are constructed using active and passive microwave measurements made by instruments onboard TRMM combined with geosynchronous infrared rainfall estimates. The result is a 3-hourly product at 0.25-degree resolution. TRMM data unarguably underestimate maximum intensity due to spatial and temporal attenuation (large cells and long 3-hour periods). Nevertheless, we argue that TRMM data can provide a great improvement for large-scale erosivity mapping. Based on simple formulas linking TRMM intensity data to erosivity, we present average monthly and yearly rainfall erosivity maps for Africa. We discuss the possible steps to take for validating our results, and indicate how results may be incorporated for effective large-scale erosion mapping and monitoring.