



Low Modern Erosion Rates observed in Steep, Sparsely Vegetated Mountain Ranges in southeast Spain

N Sougnez (1), **V. Vanacker** (1), B. van Wesemael (1)

(1) University of Louvain, Department of Geography, Louvain-la-Neuve, Belgium
(nicolas.sougnez@uclouvain.be)

In order to be able to prevent and reduce widespread degradation in desertification prone areas, there is an urgent need to understand the mechanisms controlling human-induced degradation processes in these semi-arid ecosystems. Southeast Spain is known as one of the most arid regions of Europe, and its landscape is marked by sparsely vegetated eroded hillsides. Large areas of dry cultivation have been abandoned since the early part of the twentieth century, and irrigated cultivation is now expanding rapidly.

Here, we report modern erosion rates for Southeast Spain that show distinct spatial patterns. Erosion rates for two mountain ranges belonging to the Betic Cordillera (Sierra de Torrecilla and Sierra de Carrascoy) were assessed by direct measurements of the accumulated sediment volumes behind 20 checkdams. The volume of sediment deposited behind the checkdams ranges between 4 and 920 m³, and their drainage area varies between 1.5 and 317 ha.

Our measurements indicate that mean annual basin-wide erosion rates in these Betic mountain ranges are generally low. The observed erosion rates are well below maximum tolerable annual soil loss rates for Mediterranean regions, as 90% of the basins have mean annual erosion rates below 2 t ha⁻¹ year⁻¹. Our erosion rates are concordant with the erosion rates reported by Romero-Diaz et al (2007) for the Segura drainage basin, but are significantly lower than the sediment yield data reported by Avendaño-Salas et al. (1997) and Verstraeten et al. (2003) throughout Spain.

Hence, direct association of steep, sparsely vegetated hillsides as observed in the Betic

mountain ranges with desertification and/or increased soil erosion is rooted in simplistic ideas on erosion controls. Our observations suggest that the main erosion problems are not located in these semi-natural regions of the Betic mountain ranges.

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