



Wind erosion of soil organic carbon from arable land in Aragón, Spain

Wolfgang Fister (1) and Johannes B. Ries (2)

(1) Physical Geography and Environmental Change, University of Basel, Basel, Switzerland (wolfgang.fister@unibas.ch), (2) Physical Geography, Trier University, Trier, Germany

The role of soil organic carbon erosion (SOC) in the global carbon cycle is still an unknown quantity. The effects of water erosion on SOC contents have been studied quite extensively in recent years, whereas wind erosion experienced only little attention. The objective of this study was to obtain quantitative field data on the relation of SOC contents in wind eroded sediment and in situ soils under different land use. Special attention was laid on the SOC contents by grain size fraction.

A small portable wind tunnel was used in three field surveys to generate wind erosion on different soil surfaces near María de Huerva in the Province of Aragón, Spain. In total 88 wind tunnel simulations were conducted on fallow land (undisturbed, crusted) and land used for dry farming, which is the common land use in this region. The grain sizes of the eroded material and the in situ soil was analyzed using sieves and an x-ray Sedigraph from Micromeritics. SOC was obtained for each size class by means of a LECO RC-412 combustion analyzer.

The experimental results showed that wind erosion on fallow land is almost negligible (mean below 1 g m⁻² per 10 min). Therefore only little material was available for laboratory analysis of different size classes. In contrast, wind erosion on arable land produced erosion rates up to 50 g m⁻² per 10 minutes. The effect of wind erosion on SOC contents in sediment seems to be size selective, so that the already low SOC content of the semi-arid soils is further diminished.