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International Union of Soil Sciences

# Centennial Celebration and Congress of the International Union of Soil Sciences

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## ABSTRACT BOOK



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## 6. Soil in the digital era 6.07 133441 - Soil Erosion and Land Degradation: methods, observations and perspectives

### IMPACT OF WATER EROSION ON THE FATE OF SOIL ORGANIC CARBON IN A MEDITERRANEAN CULTIVATED CATCHMENT

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Soil erosion processes have a major impact on the fate of soil organic carbon (SOC) and on CO<sub>2</sub> emissions to the atmosphere. There is intense debate in the scientific community on the overall impact of erosion on soil carbon storage, as two antagonistic mechanisms are implicated: i) the mobilization and lateral transport of organic carbon, potentially responsible for organic carbon destocking, and ii) the burial of organic carbon in deposition zones, potentially responsible for organic carbon storage. This work aimed to analyze the impact of water erosion processes on the redistribution and evolution of organic carbon biodegradability in a cultivated catchment in a Mediterranean context (Kamech, Cap Bon-OMERE, 2.63 km<sup>2</sup>). In this work, we report and discuss the SOC content and biodegradability measured on i) horizons from 11 soil profiles and additional topsoil samples to represent the diversity of soil types present in the catchment, ii) suspended sediments sampled during sixteen floods at three points in the hydrographic network, according to a nesting of scales, iii) several cores taken from sediments trapped in the hillslope reservoir located at the catchment outlet. The results highlighted the low impact of water erosion processes on organic carbon levels, both a low enrichment rate during the selectivity process and negligible transport-induced degradation due to the short distances and transfer times between sources and outlet. The analysis of SOC biodegradability along the source-transport-deposit continuum showed a significant increase of SOC biodegradability in sediments trapped in the reservoir, which could be explained by the production of highly biodegradable lacustrine organic carbon.

**Keywords:** Soil water erosion, Soil organic carbon, Carbon fate, Cultivated catchment, Mediterranean context