



Use ^{137}Cs erosion rates to quantify soil organic carbon and nitrogen redistribution in a complex Mediterranean agroforestry ecosystem, Spain

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The spatial variability of soil organic carbon (SOC) and nitrogen (SON) can be affected by environmental factors such as land use change, type of vegetation, topographic characteristics, soil management practices and specially soil redistribution processes. The use of fallout ^{137}Cs derived from nuclear testing in the past century has been widely used as a sediment tracer of soil redistribution, providing information on medium term (40–50 years) erosion rates, allowing to identify stable, eroded and depositional sites. Recent studies have examined the relationship between the patterns of SOC and soil redistribution processes using the ^{137}Cs technique and suggest that both are moved and associated with similar soil redistribution processes.

The purpose of this study is to quantify soil organic carbon (SOC) and nitrogen (SON) redistribution using soil erosion and deposition rates derived from ^{137}Cs measurements spatially distributed in a small catchment of an endorheic lake in the Spanish Pyrenees. Five complex toposequences were selected in the Estaña Lake catchment, characterized by an intricate mosaic of land use, soil types, steep slopes and anthropogenic modification. The five transects were established from the catchment divide to the central lake, with different ranges of altitude, orientation and different length, and a total of 59 sampling sites, approximately 50 m apart were established along the transects. The results obtained in this contribution aims to investigate redistribution processes of SOC and SON associated with soil redistribution processes along these complex toposequences. This particular study on sources and fate of eroded SOC and SON allow to understand soil nutrients dynamics in this catchment, and to explore the potential contribution of sediments, soil organic carbon and nitrogen to the Estaña lake.