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Effects of wildfires recurrency on soil erosion in a terraced burned Mediterranean catchment

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European Mediterranean regions are witnessing unprecedented changes owing to the impacts of global change, understood as the set of human influences on the environment and climate change. Under this context, an exacerbation of extreme events such as wildfires is expected. Wildfires are considered one of the most important factors of soil and ecosystems degradation, as soils affected by this phenomenon are erosion-prone due to the removal of vegetation and litter cover and soil physicochemical properties alteration. Fallout-radionuclides (FRNs) can be used as tools to trace soil redistribution due to erosion or deposition. Furthermore, the implementation of a re-sampling approach allows to document changes in soil redistribution under the current context of global change. This study aims to assess soil redistribution rates at different time windows through the use of fallout-radionuclides (^{137}Cs and ^{210}Pb$_{ex}$) in a mid-mountainous Mediterranean catchment affected by recurrent wildfires. Three micro-catchments (MCs) were selected within the Sa Font de la Vila River catchment (4.8 km^2); which is characterized by revegetation processes, wildfires recurrence and a huge presence of agricultural terraces: MC1 (1.73 ha; burned in 1994 and 2013), MC2 (2.28 ha; burned in 2013) and MC3 (2.24 ha; non-burned). In order to estimate soil redistribution rates in the short and medium-term after the 2013 wildfire, a resampling approach was carried out, with the first sampling campaign at the end of 2013 and the second one in 2020. In each of these campaigns, the same 80 locations were sampled within the three MCs following a stratified random sampling strategy with 21 bulk cores in MC1, 39 bulk cores in MC2 and 20 bulk cores in MC3. Preliminary results from the 2013 sampling campaign showed the following mean ^{137}Cs inventories: 434 Bq m^{-2} (MC1), 305 Bq m^{-2} (MC2) and 214 Bq m^{-2} (MC3); and ^{210}Pb$_{ex}$ inventories: 374 Bq m^{-2} (MC1), 607 Bq m^{-2} (MC2) and 515 Bq m^{-2} (MC3). The diffusion and migration model developed by Walling and He (2001) will be applied to convert the measured inventories into estimates of soil erosion or deposition rates. During the session, the implementation of this experimental design will allow to explain and discuss the main results and conclusions. This study will allow to understand the effects of a wildfire at the short and medium-term in a terraced burned Mediterranean catchment.