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Modelling Soil Erosion Risk and its Impacts in the Mediterranean area for the 21st century

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Soil degradation and erosion will be influenced during the 21st century both by climate and related or anthropogenic land use changes. Many current negative impacts of soil erosion may thus be amplified, and as certain soil thresholds are exceeded, potentially new and different problems could arise. Soils in the Mediterranean environment may be particularly vulnerable to such global changes because of contrasted climate, low vegetation cover and specific poor soil characteristics. It is therefore crucial to understand the potential impacts of global change on soils erosion and its consequences on soil functions such as support of vegetation, local water balance, loss of organic matter (on-site impacts) as well as on sediment transfer in surface water reservoirs (off-site impact). The objective of the work presented here was to improve our understanding of the impact of global change, as it can be predicted by currently used global change scenarios for the period until 2100, on soil resources and to develop indicators and models for soil vulnerability assessment within the Mediterranean basin. Specific drivers of soil erosion affected by the global change were identified and their impacts on erosion processes were quantified using erosion models at small and medium catchments scales. Soil vulnerability indicators were developed from the use of these models for the assessment of soil depth reduction and the siltation of reservoirs. The project also developed uncertainty analysis and validation of erosion prediction using results of field investigations in three test areas in France, Tunisia and Morocco.