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Estimating the impacts of climate change on soil erosion in Mediterranean watersheds

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Climate change could impact soil erosion in Mediterranean regions, through both higher climatic aridity – leading to less vegetation cover – and higher winter rainfall intensity. This could have the effect of increasing soil degradation and accelerating ongoing desertification processes. Project ERLAND aims to study the potential impacts of climate changes on vegetation growth, hydrology and erosion in Portuguese watersheds, and define the costs and benefits of different adaptation options. This will be achieved by building an ecohydrological and erosion model to two well-instrumented watersheds, in order to ensure an appropriate simulation of the most important processes which could be affected by climate change.

This presentation will illustrate the project's objectives and ongoing work on two representative agroforestry catchments with typical land cover/use conditions. The Macieira de Alcoba catchment in northern Portugal has a humid climate, and is covered with commercial eucalypt/pine forests interspersed with agricultural fields, where summer cereals and pastures are associated with vineyards. The Guadalupe catchment in southern Portugal has a dry climate and is covered with extensive cork oak forests (of a Portuguese "montado" land-use system) associated with winter cereals and pastures.

On each catchment, runoff and sediments are being collected simultaneously at the field (two open plots) and catchment (one hydrometric station) scales, together with other data such as meteorology, soil moisture, and some vegetation growth parameters. The field sites will be maintained at the present level during two years, and the hydrometric stations will be left for a larger period afterwards in order to collect the largest possible data series. The presentation will focus on the ongoing data collection on the two study sites and how the data will be used to fulfill the project's goals, i.e. the evaluation of an ecohydrological and erosion model for use in climate change studies.