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OPTIMISM Project - Erosion and sediment transport processes: analysis and modelling at different scales in the upstream part of Oum Rabiaa catchment - A case study from the Oued Srou Basin (Middle Atlas - Morocco)

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Erosion phenomena occurs via a variety of processes and the type, rate and location of erosion depends on a wide number of factors, including soil or sediment stability, vegetation, land slope, and local runoff. Erosion rates present difficulties to be precisely determined. Erosion is generally episodic, an eroding site may show no activity most of the time and erode rapidly during short, intense events. Erosion also varies spatially, over the year, most eroded sediment is likely to come from a small fraction of the land in a catchment. Given this spatial and temporal variability, it is hard to consistently extrapolate erosion observed at one location to another. To develop consistency in our estimates of erosion, the OPTIMIST project pretends to apply a multi-method approach to assess the viability of different, independent methods in a very sensible environment such as the Atlas mountains, in Morocco.

In the OPTIMISM project conducted by a Spanish-Moroccan team (MEDhyCON-UIB and DPRP-USMS), we analyse the erosion processes as well as water and sediment yields at different spatial scales at Oued Srou basin (Middle Atlas-Morocco) by numerical modelling (i.e. sediment connectivity indices and hydrological modelling) and experimental fieldwork applying a multi-technique approach (i.e. fallout radionuclides as well as continuous monitoring of water and sediment yield).

Further integrated studies are required in order to obtain a clearer understanding of sediment mobilization, delivery and deposition processes in such region, and of the role of land use and human activity in disturbing the natural conditions. Improved understanding of the spatial variability of soil erosion on slopes, of sediment sources, and of sedimentation is essential for protecting soils against erosion and reducing sedimentation problems. This project will provide knowledge to stakeholders in order to reduce erosion processes in agricultural fields as well as reducing siltation processes in dams.