



Choosing the target of adaptive soil erosion management in Mediterranean. Long vs. Extreme erosion, internal vs. external catchment dynamics

Anna Smetanova (1,2), Stéphane Follain (3), Mélodie David (1,4), Rossano Ciampalini (1,5), Damien Raclot (5,6), Armand Crabit (3), and Yves Le Bissonnais (1)

(1) INRA, Laboratoire d'Etude des Interactions entre Sol-Agrosystème-Hydrosystème, UMR LISAH, 2 place Pierre Viala, FR-34060 Montpellier cedex 1, France, (2) Research Group Ecohydrology and Landscape Evaluation, TU Berlin, Berlin, Germany (anna.smetanova@gmail.com), (3) SupAgro, Laboratoire d'Etude des Interactions entre Sol-Agrosystème-Hydrosystème, UMR LISAH, 2 place Pierre Viala, FR-34060 Montpellier cedex 1, France, (4) GEODE UMR 5602, Maison de la Recherche, FR-31500, Toulouse, France, (5) IRD, Laboratoire d'Etude des Interactions entre Sol-Agrosystème-Hydrosystème, UMR LISAH, 2 place Pierre Viala, FR-34060 Montpellier cedex 1, France, (6) Institut Agronomique et Vétérinaire Hassan II, Dept. of Natural Resources and Environment, PO. Box. 6608, Madinat Al Irfane, Rabat, Morocco

For soil resources protection and regulation of soil erosion off-site effects in Mediterranean, it is inevitable to adjust current land management planning to both, event magnitude and long-term erosion means [2, 3, 5]. Science-based soil protection measures need to be adjusted to spatial and temporal scale of practice differing between stakeholders and management aims, and reflect increasing frequency of torrential rainfalls leading to very high erosion rates in short time [3, 4]. In order to address selection of zero-soil erosion land management target, this study applies modelling approach for comparison of 7 land use scenarios using the LandSoil model [1]. We propose comparison of internal vs. external catchment dynamic at extreme event- and long-term scale as a tool for understanding effect of land management in targeting emerging erosion and connectivity patterns. Our results suggest, that proposed approach can be applied to identify best management scenario practices regarding different management aims of farmers and watershed managers.

[1] Ciampalini R, Follain S, Le Bissonnais Y. 2012. LandSoil: A model for analysing the impact of erosion on agricultural landscape evolution. *Geomorphology* 175–176: 25-37.

[2] David M, Follain S, Ciampalini R, Le Bissonnais Y, Couturier A, Walter C. 2014. Simulation of medium-term soil redistributions for different land use and landscape design scenarios within a vineyard landscape in Mediterranean France. *Geomorphology* 214: 10–21.

[3] Smetanová A, Le Bissonnais Y, Raclot D, Nunes JP, Licciardello F, Le Bouteiller C, Latron J, Rodríguez-Caballero E, Mathys N, Klotz S, Mekki I, Gallart F, Solé Benet A, Pérez Gallego N, Andrieux P, Moussa R, Planchon O, Marisa Santos J, Alshihabi O, Chikhaoui M., submitted. Patterns of temporal variability and time compression of sediment yield in small Mediterranean catchments. *Soil Use & Management*

[4] Smetanová A, Paton E, Maynard C, Tindale S, Fernandez-Getino A-P, Marques MJ, Bracken L, Le Bissonnais Y, Keesstra S. submitted -b. Stakeholders' perception of the relevance of water and sediment connectivity in water and land management. *Land Degradation & Development*

[5] Stroosnijder L. 2005. Measurement of erosion: Is it possible? *CATENA* 64: 162-173.