



Soil erosion and sediment connectivity modelling in Burgundy vineyards: case study of Mercurey, France

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This research aims at assessing the impact of agricultural landscape structure on soil erosion and sediment connectivity at the catchment scale. The investigations were conducted the vineyards of Mercurey (Burgundy, France), characterized by important issues related to soil loss, flash floods and associated management infrastructures maintenance.

The methodology is based on two main steps that include (1) field investigations and (2) modelling. The field investigations consists in DEM acquisition by LiDAR imaging from a drone, soil mapping and human infrastructures impacting runoff classification and mapping (such as crop rows, storm water-basins, drainage network, roads, etc.). These data aims at supplying the models with field observations. The modelling strategy is based on two main steps: First, the modelling of soil sensitivity to erosion, using the spatial application of the RUSLE equation. Secondly, to assess the sediment connectivity in this area, a model based on graph theory developed by Cossart and Fressard (2017) is tested.

The results allow defining the influence of different anthropogenic structures on the sediment connectivity and soil erosion at the basin scale. A set of sub-basins influenced by various anthropogenic infrastructures have been identified and show contrasted sensitivities to erosion. The modelling of sediment connectivity show that the runoff pattern is strongly influenced by the vine rows orientation and the drainage network. I has also permitted to identify non collected (by storm water-basins) areas that strongly contribute to the turbid floods sediment supply and to soil loss during high intensity precipitations events.