



## **Mapping soil physical and chemical parameters in a farmland catchment: implications for soil budgets at field and hillslope scales**

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Maps provide spatially distributed information of physical, chemical, topographic, climatic, geomorphic and land use and management parameters and processes. This data allow estimating soil budgets at field and catchment scales. Besides, maps make up the main input of rainfall-runoff and soil erosion models. Thus, accurate mapping becomes necessary to obtain representative values and rates in agricultural and environmental studies.

In this study, we generated different maps of eleven soil physical and chemical properties in a Mediterranean rainfed agricultural sub-catchment (27.3 ha) located in the Ebro River Basin (Aragon, NE Spain; 42° 02' 00'' N; 0° 04' 12'' E). Topography is hilly with a mean slope gradient of 13%. Soils are Haplic Regosols (calcaric; RGca) in the upper part of the hillslope and surrounding the divides, and Luvic Calcisols (CLI) near the bottom. Land is mainly devoted to agriculture: four vineyards (15,039 grapevines arranged in 147 straight lines), five cereal fields, one abandoned and one commercial (314 trees) olive grove. Small patches of natural vegetation appear throughout the landscape (12% of the total area). A total of 222 soil samples (250 cm<sup>3</sup> per sample) were collected in 74 points (3 replicates per point). Then, the bulk density (gr / cm<sup>3</sup>), the content of coarse fragments (> 2 mm, % weight), clay (0.04 - 2 μm), silt (2 - 63 μm) and sand (63 - 2000 μm) was measured, and the effective volume of the soil (%) and the texture classification were determined. The content of total nitrogen (TN; %), phosphorous (TP; mg /Kg), potassium (TK; mg /Kg) and soil organic carbon (SOC; %) was determined. Different kriging interpolation options were used obtaining clear differences in the soil budgets at the different compartments: rows, inter-row areas, corridors, at each field and land use, and at sub-catchment scale.