



Inspecting the effect of climate and land use changes on a Mediterranean vineyard landscape

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Vineyard landscapes are a common, characteristic feature of the Mediterranean regions. In a global change context, land use and climate are supposed to deeply impact on hydrology and soil loss of these delicate environments. Here, we analyse the results of long term soil erosion simulations carried out using LandSoil model in a small vineyard catchment of the southern France inspecting the impact of climate and land use (LU) as follows. Climate impact have been tested simulating: 1) historical rainfall series (1992-2012) and, 2) future climatic scenario (2040-2060) as the result of RCM (ALADIN53) on a RCP4.5 CO₂ emission configuration. Changes in land use and its relative patterns are simulated producing four different scenarios as the result of socio-economic influences on the agricultural system as follows: 1) Business-as-usual, subsequent to the last decade's LU trend changes; 2) Productivist, enhancing the agricultural production with the use high productivity grapes and chemicals such as fungicides and pesticides; 3) Environmental protection, improving ground water protection and biodiversity, and; 4) Sustainable, focusing on local agricultural production and quality of the products. The analyse of the results shows that climate can influence soil loss, both directly and indirectly driving LU changes, but remaining globally a second level driver. Land use responds to socio-economics levers and, as a consequence of the high differentiation in scenarios, can produce much more variability in the results.