



Modelling sediment carbon in olive groves at the micro-catchment scale with the AnnAGNPS model: a preliminary study to explore sensitivity to different soil properties and managements

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1% of the world agricultural area is dedicated to olive groves. 48% of world olive oil is produced in Spain, on an area of 2,6 Mha of which, more than 60% is located in Andalusia, in the Southern region (Vilar and Pereira, 2017). Despite the economic, social and cultural relevance of olive grove in the Mediterranean Basin, some studies have highlighted the crop's susceptibility to land degradation and loss of biodiversity, in particular when climate change is considered. In this context, the analyses and monitoring of soil organic carbon (SOC) stock changes are crucial to identify risk of desertification and to fulfill environmental protection global conventions (FAO, 2018).

In this work, a sensitivity analysis of the AnnAGNPS model (Bingner et al., 2018) to characterize the impact the different groups of input parameters under real scenarios of extensive olive groves in Andalusia (Spain) is going to be presented. The main aim is to evaluate and to compare the impact on carbon dynamics in an extensive olive orchard catchment where different soil types and managements were parameterized and contrasted with varying hydrological periods through AnnAGNPS simulations.

Firstly, model parameters will be evaluated and grouped by soil categories, hydrological features, and management in order to quantify their impact on the sediment carbon loads at the event, monthly and annual scales. A total of 108 scenarios will be prepared in order to describe the influence of 6 soil types, 3 managements (no-till, conventional till and no till with spontaneous grass cover), 3 different rates of fertilization and 2 contrasted organic carbon life-time. On the other hand, the variations of ground carbon content will be also studied at the annual scale. A sensitivity analysis based on the Regression method (Song et al., 2015) will allow us to observe the most significant parameters and features as well as the suitability of the results when comparing bibliographical data.

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