



Spatial and vertical distribution of soil organic carbon at the catchment scale in Mediterranean ecosystem

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Soil organic carbon (SOC) plays an important role in enhancing crop production and mitigating additional greenhouse gas emissions. In fact, the assessment of the amount of SOC at the regional scale is important to better understand the role of the SOC reservoir in global climate and environmental issues. Besides, the vertical SOC profile may be of great importance for SOC cycling, both on short time scale, due to interactions with the soil temperature and moisture profile, as well as on long time scale because of depth-specific stabilization mechanisms of organic matter. The objective of this study is: i) to characterize the spatial variability of SOC in a catchment at different soil depths and ii) to assess the contributions of factors controlling this variability.

The studied catchment, named Lebna, is located in the Cap Bon north-eastern Tunisia and it covers about 218 km². We used a dataset from a survey provided by the IAO (Instituto Agronomico per l'Oltremare) 20th course professional master “remote sensing and natural resources evaluation” field survey staff from 2 to 28 April 2000 (IAO, 2002). Ninety-one profiles with 345 soil horizons were described according to the IAO framework and the total carbon was determined using the combustion method with the Carlo Erba Analyser 1500.

The results showed the high spatial variation of SOC content depending on soil types and land use. In fact, agricultural practices mainly crop residues management and tillage influence SOC dynamic. Concerning vertical distribution, SOC content is higher in topsoil compared to subsoil. The results suggest that further work is required to better characterize the quality of the SOC at different depths.