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Evaluating impact of climate change on soil quality indicators in the Mediterranean region

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More reliable quantification of the impact of climate-change on soil quality and its ecosystem services is required to adapt patterns of yield and productivity, forest management, and resource availability. In this context, the present study evaluates the effects of climate change on agriculture soil and forest capacity as well as on its vulnerability to degradation process like erosion and soil contamination, in the Mediterranean region of Andalusia (S, Spain). Five models: Terraza, Cervatana, Sierra, Pantanal and Raizal included in the MicroLEIS DSS, Agro-ecological land evaluation decision support system, were used. While Cervatana forecasts the general land use capability or suitability for a broad series of possible agricultural uses, Sierra model predicts the forestry land suitability for the presence/absence of 22 typical Mediterranean forest species. Additionally, Pantanal and Raizal predict the soil vulnerability for contamination and erosion process respectively. The evaluations models were applied in the the current and future scenarios of climate change (A1B) for the periods 2011-2040, 2041-2070 and 2071-2100. The interpretation of the evaluation results in the different scenarios allows quantifying the effects of climate change in terms of agricultural productivity, forestry land suitability, erosion and contamination risks. Furthermore, the present research discriminates the types of soils which are more affected to the impacts of climate change. This research uses a methodology for scaling up information generated and collected at the local level in a bottom-up approach and improves the understanding of the effects of climate change on Mediterranean soils.