



Mediterranean agro-climate projections and the case of olives in Andalusia: results from the MED-GOLD project.

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Horizon 2020 Med-Gold is an EU funded project which aims to make European agriculture and food system more competitive, resilient, sustainable and efficient in the face of climate change, by using climate services to minimize climate-driven risks/costs and seize opportunities for added-value. The ongoing project aims to demonstrate the proof-of-concept for climate services in the agriculture sector by developing case studies for three staples of the Mediterranean food systems: grape, olive and durum. In this study we examine the impact of climate change on olives and the olive oil sector in general, in Andalusia, combining different information compiled during the early stages of the project. To this aim, daily data for temperature and precipitation from a five member ensemble of Regional Climate Models from the Euro-Cordex database are used. The data cover the period 1971-2100 under two RCP emission scenarios, namely RCP4.5 and RCP8.5. The analysis is performed on three periods: the 1971-2000 which is used as a reference period and two future periods, the 2031-2060 and the 2071-2100. In addition, daily data from the E-OBS database are used to evaluate the climate models during the period 1971-2000. Regarding the models' performance against E-OBS, the analysis revealed both cold (wet) and warm (dry) biases for temperature (precipitation), depending on the model. Therefore, we opted to perform bias adjustment to the models' output. Moreover, a number of climate threshold indices specifically tailored within the project and based on the analysis of the good and the bad years as derived from the different phenological stages of the olives, olive production and crop quality as well as from olive's survival, are examined. The results on both the return periods as well as the changes between the two future periods and the reference period for the various indices, indicate that future higher temperatures and decreased precipitation poses a negative impact on the olives with the most pronounced evidence towards the end of the century and under RCP8.5 future emission scenario.