

ABSTRACT

7th International Conference on Meteorology and Climatology of the Mediterranean

Spain | Palma | 4 – 6 March, 2019



Id

955

Date

30/10/2018 23:07:00

E-Mail

maria.cardell@uib.es

Type

Authors

3

>5 Authors

☐

	Author 1	Author 2	Author 3	Author 4	Author 5
First name	Maria	Arnau	Romualdo		
Middle	Francisca				
Last name	Cardell Martínez	Amengual Pou	Romero March		
Email	maria.cardell@uib.es	arnau.amengual@uib.es	romu.romero@uib.es		
Institution	University of the Balearic Islands	University of the Balearic Islands	University of the Balearic Islands		
City	Palma de Mallorca	Palma de Mallorca	Spain		
Region	Balearic Islands	Balearic Islands	Balearic Islands		
Country	Spain	Spain	Spain		

Session

1) Climatology

Title

Future effects of climate change on the suitability of agricultural crop production over Europe

Abstract Europe is one of the world’s largest and most productive suppliers of fruit and fibre crop production. Owing to climate change, modified patterns of mean temperature and precipitation will likely affect agricultural crop production across Europe. Furthermore, the occurrence of extreme weather events (e.g. heavy precipitations, persistent droughts, heat waves, etc.) might be increasingly responsible for important agriculture-related economic losses and a redistribution of optimum growing conditions in many areas of the continent, specially in the Mediterranean region. Prospects on the future of mean regimes and extreme events (combined with temperature/precipitation-based climate indexes relevant to agriculture) are derived from observed and model projected daily meteorological data. Specifically, daily observed series of precipitation and 2-m maximum and minimum temperatures from the E-OBS data-set have been used as the regional observed baseline. For projections, the same daily variables have been obtained from a set of regional climate models (RCMs) included in the European CORDEX project, considering the rcp4.5 and rcp8.5 future emissions scenarios. The adoption of a multi-model ensemble strategy allows quantifying the uncertainties arising from the model errors and the GCM-derived boundary conditions. To project the RCM data at local scale properly, a quantile–quantile adjustment has been applied to the simulated regional scenarios. The method detects changes in the cumulative distribution functions (CDFs) between the recent past and successive future time-slices of the simulated climate and applies these changes, once calibrated, to the daily observed series. Results on the future impact of temperature and precipitation mean regimes and extremes over different crops (wine grape, tomato, chickpeas...) will be presented by applying different quantitative impact models adapted to regional contexts. With this information at hand, policy makers and stakeholders can support the adaptation of European agriculture to climate change by encouraging the flexibility of land use, farming systems and crop production.

Key words

Europe, Climate change, Agriculture, Crop production, Regional climate models, CORDEX, Temperature, Precipitati