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Climate change assessment for Mediterranean agricultural areas by statistical downscaling

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Abstract. In this paper we produce projections of seasonal precipitation for four Mediterranean areas: Apulia region (Italy), Ebro river basin (Spain) and Antalya province (Turkey). We performed the statistical downscaling using Canonical Correlation Analysis (CCA) in two versions: in the first case Principal Component Analysis (PCA) filter is applied only to the predictor and in the other to both predictor and predictand. After performing a validation test, CCA after PCA filter on both predictor and predictand has been chosen. Sea level pressure (SLP) is used as predictor. Downscaling has been carried out for the scenarios A2 and B2 on the output of three GCM's: the CCCma-GCM2, the Csiro-MK2 and HadCM3. Three consecutive 30-year periods have been considered. For Summer precipitation in Apulia region we also use the 500 hPa temperature as predictor, obtaining comparable results. Results show different climate change signals in the four areas and confirm the need of an analysis capable of resolving internal differences within the Mediterranean region. The most robust signal is the reduction of Summer precipitation in the Ebro river basin. Other significant results are the increase of precipitation in Apulia in Summer, the reduction over the Po-valley in Spring and Autumn and the increase over the Antalya province in Summer and Autumn.

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