



Detection of an anthropogenic influence on the observed near-surface temperature and precipitation trends over the Mediterranean area

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In present work it is investigated whether anthropogenic forcing is a plausible explanation for the observed precipitation and near-surface temperature trends over the Mediterranean area. To this aim trends in mean precipitation and temperature over the Mediterranean area are compared to human induced changes as predicted by a set of AOGCMs of the CMIP3 database and a set of three regional climate model simulations. In this study the methodology proposed by Bhend and von Storch (2007 and 2009) is used. As indicated by four measures of pattern similarity statistics the pattern of recent trends in mean precipitation and near-surface temperature are consistent with the estimates of the response to anthropogenic forcing. Although anthropogenic forcing is the dominant forcing, we are not able to separate the anthropogenic and natural influence on the observed changes. Bootstrapping technique is used to assess the field significance of the patterns of observed trends. Results indicate that the observed changes in mean precipitation and temperature are very likely not caused by internal variability alone. The four measures of pattern similarity statistics, used in this study, provide good evidence that human-induced forcing has recently played an important role in precipitation and near-surface temperature trends over the Mediterranean area. This finding was robust to the removal of the signal of the North Atlantic Oscillation.