



Potential future changes in statistical characteristics of temperature and precipitation extremes around the Mediterranean

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There is a general agreement that impacts of climate changes on society and ecosystem are likely associated rather with changes in climate variability and extremes than with changes in mean climate. Recent anomalous weather events over the Mediterranean and significant changes in the extremes found along last decades pose the question whether the climate in this region is become more variable and more extreme.

In this study we analysed extremes of annual minimum and maximum temperature and seasonal precipitation in simulations performed with a variable-grid atmospheric general circulation model, the LMDZ, zoomed over the Mediterranean for three time slices (control climate 1970/1999, future climates 2030/2059 and 2070/2099). Statistical characteristics of extremes are obtained from their Generalized Extreme Value distribution defined by the location, scale and shape parameters.

The results show similar spatial structures of the changes within each scenario in 2030/2059 and 2070/2099, but the magnitudes of changes are greater in the middle of the century than at its end. There is increase in both annual minimum and maximum temperature. These changes are due to shift of the whole distribution to warmer values. Additionally, changes in cold extremes are also associated with changes in scale of the distribution, measure of interannual variability. Precipitation extremes increase in all seasons except summer, that is associated with increase of inter-annual variability. It is worth to note that mean precipitation decrease in winter, spring and summer. There is a modest significant correlation between changes in precipitation extremes and changes in all three distribution parameters.