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Extreme temperature contrast of the year 2012 in Greece: An exceptionally cold winter and a record breaking summer

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During the past decade several regions all over Europe have experienced severe heat waves with serious social and environmental impacts. The year of 2003 was characterized by record breaking high temperatures for central Europe, while the year of 2007 was a remarkably warm year of the majority of the Eastern Mediterranean. During this year, three major heat waves were detected in Greece during summer and abnormally high temperatures were also observed through the cold season of 2007. It was found that the winter minimum temperatures were statistically more extreme than the summer maxima. Moreover, exceptionally high maximum and minimum temperatures occurred in November of 2010 affection the entire Greek region while September of the following year was also characterized by large departures of maximum temperatures from the long term mean values and the highest minimum temperature average in comparison to the reference period 1958-2000.
The past year (2012) could also be characterized as a year of extremes. This time a temperature contrast was detected in the domain of study with a prolonged cold – season spell during winter and new record – breaking extreme maximum and minimum summer temperatures. More specifically it was found that the summer of 2012 was the warmest one since 1958. The whole season was characterized by long – lasting warm conditions with large departures from the long term (up to 4oC for Tmax) and this warming phenomenon was more intense during July and August. In contrast the winter season (December 2011 – February 2012) was found to be in the ten coldest winters of the last 55 years. The departures from the mean are lower than summer (1oC to 1.5oC negative anomalies) but most of the days were found to have lower Tmax, Tmin and Tmean values than the average daily temperatures of the period 1958-2000. Finally, it is worth mentioning that the year of 2012 was characterized by the highest annual temperature range reaching up to 26oC in several stations.
Consequently, these abnormal cold (warm) conditions during the winter (summer) months motivated the present study in order to conduct a statistical analysis of these temperature extremes and their characteristics in addition to an investigation of the synoptic large scale atmospheric conditions which possibly result to this year of contrasts.

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