



The exceptional warm summer of 2007 in Athens. A 'normal' summer in the future Mediterranean climate?

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The historical meteorological record of the National Observatory of Athens (NOA) dates back to the midst of the 19th century. The analysis of the temperature time series of NOA has shown a long term overall positive trend which is statistically significant and more pronounced during the warm period. The annual trend for the maximum temperature was found to be 1.25 C/100yrs but doubles during the last 30 years. In addition to this trend a very important feature of Athens' recent climate is the dramatic increase of the frequency of hot days and warm episodes (sequence of consecutive hot days) as well as the increase of the persistence of these episodes. From the end of June until the beginning of September 2007, South-Eastern Mediterranean areas like Greece, Italy and the Balkans experienced a sequence of heatwaves and unprecedented warm conditions which in many cases resulted in absolute maximum temperature records. The rarity of the event is better highlighted when analysing historical temperature records. According to NOA's records, the period from June to August 2007 was the warmest ever recorded in Athens since 1863 (there are no systematic observations before) with respect to mean and absolute values. The summer mean, mean maximum and mean minimum temperatures were 29.1 C, 34.9 C and 24.4 C respectively exhibiting pronounced positive anomalies of about 3 C from the corresponding seasonal climatic values. These are the warmest seasonal values of the historical record and are very close to the 90th percentile of daily mean, maximum and minimum temperatures in summer of the period 1961-1990. It was estimated that for more than 40% of the 92 days of the typical summer period (June-August 2007), maximum temperature peaked above the 95th percentile of the daily maximum temperature of the 1961-1990 period and daily positive anomalies reached up to 13 C.

Night time temperatures remained also at very high levels. For 85 out of the 92 nights of the studied period, minimum temperature was above its climatic value and positive anomalies during night reached up to 8 C. The value of 44.8 C was recorded at NOA on 26th June during the first and more severe heatwave of the summer. This temperature consists the absolute maximum value of the historical time series and exceeds the previous record value observed in June 1916 almost by 2C. Even higher temperatures exceeding 46 C were recorded at nearby stations in the center of the city. Although summer 2007 was an extreme intense event, as a single event it cannot be considered as proof of global warming. Nevertheless, several regional climate model simulations undertaken for the East Mediterranean and the Balkan peninsula indicate that summer 2007 reflected the extremes of temperatures that summers are projected to occur in the later part of the 21st century. In this respect, the heatwaves that affected the regions during summer 2007 bear a close resemblance to what many regional climate models are projecting for late 21st century summers.