



Heatwave occurrences over Ankara and its simulations by WRF-ARW

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The aim of this study is to determine the heat waves affecting the capital city of Turkey, Ankara, from observational records and to simulate them by using meso-scale atmospheric model of WRF-ARW. First we used maximum temperatures and 2pm relative humidity data to calculate the daily apparent temperatures for the 1965-2006-summer period. Then, the days were identified as heat wave days if the apparent temperatures should exceed the 90th percentile of the apparent temperatures in Ankara for at least three consecutive days. We have found that there were 49 heat waves in summer months between 1965 and 2006. Statistical analyses show that both the frequency of heat waves and the number of days within the heats waves have been increased from 1965 to 2006. Among 49 cases, two extreme heat waves were selected for simulation. First one (2-16 July 1996) is the longest heat wave and the second (26-31 July 2000) is the most intense heat wave recorded in Ankara. WRF-ARW model are used in three nested domain forms with the highest resolution of 3km. It is initialized and forced from the lateral boundaries by NNRP data set. The result of the simulations shows the effect of the pressure patterns on heat advection. During heat wave events, Arabian low and extended Azore High trough the central Mediterranean play crucial role on the transport of warm and humid air towards Ankara region. Besides, the precipitation regimes around Ankara in the previous season (winter and spring) before the month of the heat wave trigger the heat wave occurrences. Our findings suggest that the dry winters and springs cause the soil moisture deficits and strengthen the heat advection through the region and result in heat waves.