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Examining the Interaction Between the Sea Breeze and the Timing of the Daily Maximum Temperature in Summer Season over the Mediterranean Region of Turkey

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In this study, sea-breeze and its effects on timing and severity of maximum temperature have been analyzed over the Mediterranean basin of Turkey for the period of the 2007-2013 summer season. The calculation of the extreme climate index TX35 (days of Tmax $>$ 35 $^{\circ}$C) by using the station data indicated that TX35 is less than expected over southern coasts of Turkey. Therefore, the purpose of this study is to define days of extreme temperatures in terms of the sea-breeze phenomenon over the coastal region. Sub-daily (hourly) observations for wind speed, direction frequencies and temperature from the selected meteorological stations (totally 21) in Mugla, Antalya, Mersin, Adana and Hatay Provinces have been analyzed. Two of the five stations are located inland for Adana province. The sea breeze is observed in the coastal stations and the maximum temperature occurred before 13:00. However, the maximum temperature is observed one hour later at 14:00 for inland stations in same province and it exceeds 35 $^{\circ}$C. We also examined the similar characteristics for the coastal and inland stations of Mugla province. In addition, the maximum temperature from daily high-resolution gridded data (E-OBS) and daily 10-m surface wind from ERA-Interim dataset have investigated to define correlation between the wind speed-direction and maximum temperature. Daily analysis present that the days of the highest maximum temperature observed in each summer months coherent the weak (or no) sea-breeze. The monthly means of summer months also indicate that the wind vectors at 12:00 GMT (3 pm at local) explains clearly the sea-breeze over the coast of Mediterranean basin, since prevailing wind is mainly from the southwest, meanwhile the surface wind over the Mediterranean Sea is mostly from the west. Consequently, the sea-breeze causes that the maximum temperature does not exceed 35 $^{\circ}$C after 12:00 for central provinces of the Mediterranean region of Turkey.