Geophysical Research Abstracts
Vol. 16, EGU2014-16032, 2014
EGU General Assembly 2014

Spatial and Temporal Variations of Thermal Indices in Western Turkey

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Recent studies demonstrated frequency and probability of extreme events over the Mediterranean Basin. Many recent studies are highlighted the climate change effects of water source, temperature, precipitation in Turkey. In addition, awareness and understanding studies have been researching to adaptation for climate change impact.

Lately, numerous climatic indices are developed and determined for human bioclimatic conditions. These indices are used different meteorological parameters for assessing thermal comfort. In this study are used heat index, effective temperature, wet-bulb-globe temperature and apparent temperature indices. Air vapor pressure, temperature, relative humidity and wind speed data are very effective meteorological parameters over the sensitive temperature. Daily mean temperature (˚C), relative humidity (%), wind speed (m/s) and vapor pressure (hPa) data are used in this study. Using the thermal indices is calculated to long-term data from 60 stations distributed over the western part of Turkey. The Mann-Kendall test is applied to identify statistically significant trends at each series of thermal indices. The results of this study have shown that there are marked spatiotemporal variations in the thermal indices in the western part of Turkey. Increasing trends are stronger in summer compare with other season. Analysis are displayed that the increasing trends start 1980s. High values of these indices are mainly connected to northerly winds and weakly etesian winds in winter and summer, respectively.

Keywords: Turkey, wind speed, relative humidity, temperature, thermal indices, Mann-Kendall.