EMS Annual Meeting Abstracts
Vol. 10, EMS2013-21, 2013
13th EMS / 11th ECAM


# A regional study of several extreme temperature indices over Murcia Region (Spain)

E. Hernandez (1) and J.A. Garcia-Valero (2)

(1) AEMET, Research and Development, Guadalupe (Murcia), Spain (ehernandezg@aemet.es), (2) AEMET, Research and Development, Guadalupe (Murcia), Spain (jugarciav@aemet.es)

Under a context of Climate Change as current (IPCC), it is necessary to have complete, long and homogeneous series that allow the analysis of their natural variability as well as mean and extreme values. It has demonstrated that extremes are a key aspect of climate change and they play a critical role in the development and in the management of emergency situations, like heatwaves.

Changes in maximum temperature over Murcia Region (Spain) from 1950 to 2010 were evaluated on the basis of daily maximum temperature series measured by 83 meteorological stations located over the region. Data were obtained from the Spanish Meteorological Office (AEMET).

Daily maximum temperatures, underwent some quality control tests, were homogenized by means of the SNHT test, using Climatol (R package). Afterwards, the spatial-temporal analysis for the daily regionalization of maximum temperatures in Murcia Region was carried out, using a K-means clustering process applied to the retained Principal Components obtained from the daily homogeneous series. Four regions with geographical characteristics well defined were obtained by the regionalization process.

A seasonal analysis of regional series based on the estimation of trends for several extreme indices defined by the CCI/CLIVAR (SU25, TX90p, TX10p and WSDI) were performed. Although some results have a regional dependence, others indicate a global signal, showing for all regions a positive and significant trend specially in summer, when the occurrence of warm days (TX90) has become more frequent in the last 60 years (trends around +2.5 days/dec). However, results suggest a decrease of warm extreme and an increase of cold days in autumn, most significant at highland regions. In winter and spring more regional trend differences appear. On the one hand, the most significant changes in winter were found for highlands regions where warm and cold days have increased similarly (around +1days/dec). Finally, summer days (SU25) have experienced an important increase at lowlands in spring.