EMS7/ECAM8 Abstracts,
Vol. 4, EMS2007-A-00045, 2007
7th EMS Annual Meeting / 8th ECAM

Heat waves prediction system in a Mediterranean area (Valencia region)

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Within the framework of climate change, summer temperatures are of special interest because of the economic, social and environmental impacts derived from their hypothetical increase. A number of recent studies have shown a worldwide trend towards increasing summer temperatures that can cause extreme heat waves. With the aim of impact minimization, the meteorology department of CEAM has implemented a regional heat waves forecast and alert system in the Valencia Region, currently in use by the Regional Government.

Prior to the design of the operational system, a study about heat waves in our region was carried out from several perspectives: 1) analysis of the synoptic patterns leading to heatwaves; 2) geographical analysis of the Valencia region according to thermal homogeneity, and 3) statistical analysis to define different risk thresholds for each geographical area. Specific thresholds for each of the 30 thermoclimatic areas of the Valencia Region have been stablished after the study.

Eventually, a forecast and alert system has been also build based upon the Regional Atmospheric Modelling System (RAMS). RAMS model is run daily on an operational basis to forecast temperatures at high spatial resolution over the Valencia Region. The model results are then checked against the specific treshold of each area and an alert level is calculated. Daily risk charts issued by the system are broadcasted by means of Internet.

Results from the 2006 summer campaign have been used to validate the results of the forecast system, providing good agreement between forecasted and observed alert levels.