

The Evaluation of the Portuguese Meteorological Network for Small-Scale Climate Variability Detection.

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The impacts of apparent climatic change have been reaching out considerable importance in the last years. In the last two years, the impact on the water resources in Portugal for is such an example. Trends or patterns in climatological records form the basis of our understanding and of monitoring the climate variability in the spatial and temporal domain. The Portuguese National Institute of Meteorology (IM) database provides a key source of historical meteorological information for the detection and monitoring of climatic variability. However, the meteorological network was not designed to achieve this purpose, and preliminary evaluations indicate that only few weather stations meet the criteria which would be necessary for being included in a climatological “sub-network”. The question of the adequacy of the Portuguese meteorological network to meet this need for information on climatic variability has been addressed earlier by the authors, through a systematic process of network evaluation and planning. This process is intended to lead to the evolution of an appropriate network of climatic stations. What can the IM database tell us about climatic variability in Portugal? Can the national meteorological network be used now for detecting, monitoring, and forecasting the effects of climatic variability, for instance, on the Portuguese water resources? This paper outlines the strategy being used by the authors to answer such questions, based on quantitative methods. We followed a methodology, based on the concept of entropy given by the Information Theory. This methodology will be applied to analyse the seasonal time series of air temperature and precipitation recorded by IM during the period 1956-2005 (half century) in 22 weather stations adequately selected. A previous analysis of data quality was achieved. We present the percentage of reduction of entropy (compared to the maximum) achieved with the selected network. The results are compared with those obtained with spatiotemporal variographic analyses.