



Calculation of climatic reference values and their use for automatic outlier detection in meteorological datasets

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There are a large variety of techniques to produce digital maps of climatic parameters. There is not a perfect method for the spatial interpolation of data, as well as there is not a unique solution for this interpolation in a particular case. The selection of the most suitable method has to be made according to the characteristics of the spatial distribution of the climatic element to be analysed, the time and spatial scale of the representation, the physiographical features of the territory and the density and regularity of the observation network. Sometimes, different approaches have to be tested and a validation procedure -a statistical analysis of the estimation uncertainty- has to be established. The representation of the monthly and annual average air temperature and atmospheric precipitation over Catalonia is presented. The region is located in the north-eastern part of the Iberian Peninsula and presents a huge geographic diversity, from the Mediterranean Sea to peaks over 3000 m above sea level in the Pyrenees. The meteorological dataset used in the study contains monthly data averaged over a 30-year period from 302 pluviometric and 132 thermometric stations located in Catalonia and neighbouring areas. The auxiliary geographical information, such as distance to sea or smoothed values of altitude, has been retrieved using a GIS from a digital elevation model with a 200-m resolution. The representation is carried out with a combination of statistic and deterministic methods of interpolation. First, a model relating the climatic element with different physiographic parameters is obtained using multiple regression analysis: the best-correlated parameters turn out to be altitude and distance to sea with temperature and latitude, longitude and a smoothed altitude with precipitation. Afterwards, the part of the analysed field that is not explained by the model is interpolated using standard kriging techniques. In order to estimate the

uncertainty, the initial data sample is split into two parts that are, respectively, used for estimation and validation. The maps of climatic parameters obtained following the described method are then used in the automatic outlier detection in meteorological datasets. The outliers are identified after the comparison of values from a given meteorological dataset with their corresponding climatic reference values