Geophysical Research Abstracts,
Vol. 11, EGU2009-10610, 2009
EGU General Assembly 2009

Angular Distance Weighting technique for developing a daily high-resolution gridded precipitation dataset for the South of the Iberian Peninsula

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An assessment of the skill of "Angular Distance Weighting" (ADW) technique used to interpolate daily precipitation records is presented. A dataset of 102 stations in the South of the Iberian Peninsula for the period 1961-2000 was used after overcoming a quality control carried out to ensure the homogeneity of the series. The interpolation method was evaluated for different values of the exponent of the weight function for the distance between stations (parameter m = 2, 4 and 8), the Correlation Decay Distance (CDD) and the amount of stations considered in order to create the interpolated values. Finally, a cross-validation exercise 'leave one out', calculating the Pearson correlation coefficient (R), the root mean squared error (RMSE) and the mean bias error (MBE), has been carried out.

The worst correlation values were found in the East part of the region under study. This result may be consequence of convective precipitation nature in this area, due to its orographical characteristics and the different Atlantic influence on this region. The highest RMSE and MBE values were found in the South. The reason of this result is the existence of a specific microclimate displayed by the singular behaviour of a station located in this area (Grazalema), where much higher values of precipitation than in closed stations have been found, so the interpolated values can be affected.

In addition, worse results for R, RMSE and MBE were found using m = 8, while there are no significant differences between m = 4 and m = 2. Finally, varying CDD along with the number of stations considered, the results suggest that lower CDD values and larger number of station provide better results.

Acknowledgements: The Spanish Ministry of Science and Innovation, with additional support from the European Community Funds (FEDER), project CGL2007-61151/CLI, and the Regional Government of Andalusia project P06-RNM-01622, have financed this study.

Key words: interpolation method, gridded daily precipitation, angular distance weighting.