High resolution interpolation of decadal and therty years mean temperatures of Sardinia

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Interpolation of monthly averages of maximum and minimum temperatures on a 250 m grid by multilinear regression his presented here. The principal aim is to find a suitable parameter for minimum temperatures interpolation in case of nocturnal inversions. For this purpose a geostatistical parameter has been calculated and tested. It is related to the height relative to the valley. The second aim is to find how the sea distance enters in the regression equation, if in a linear or non linear form and if nonlinear, what is the best exponent. The procedure has been tested on a one year data collection from 60 meteorological stations on Sardinia Island. The parameter that contains most of the variance is the height; the second one, for minimum temperatures, is the relative height; for maximum temperatures the second parameter, but only in summer months, is the sea distance. The effect of relative elevation in the regression is that of increasing the coefficient of determination of about 15%. At the same time it lowers significantly the RMSE. The procedure has then been applied to monthly averages of maximum and minimum temperatures of decade 1995-2005 and thirty years 1961-1990. For the decade 1995-2005 RMSE on independent data ranges from 1.0 °C to 1.25°C for minimum temperatures and from 0.35°C (winter months) to 0.88 °C (summer months) for maximum temperatures. The portion of total variance described by the regression ranges between 73% and 79% for minimum temperatures, between 77% and 97% for maximum temperatures.