Geophysical Research Abstracts
Vol. 14, EGU2012-10900, 2012
EGU General Assembly 2012

Spatial gridding of daily maximum and minimum 2-m temperatures backed with satellite observations

S. Krähenmann and B. Ahrens

Frankfurt am Main, Institute for Atmospheric and Environmental Sciences, Geosciences, Frankfurt, Germany (kraehenmann@iau.uni-frankfurt.de)

The usefulness of the remotely-sensed variables land surface temperature (LST) and cloud cover (CC) as predictors for land-only daily gridding methods for station observations of minimum and maximum 2-m temperature (Tmin/Tmax) was assessed. A comparison of four similar gridding methods was conducted, all of which applied combinations of regression and sequential gaussian simulation (SGS) which considers the spatial variation explained by applied predictors, but differed in applied interpolation steps and predictors combinations used. SGS is related to kriging, it is a common method used to create multiple equiprobable realizations based on conditioning observations, and allows for straightforward determination of the interpolation uncertainty which was another key element of this study.

The robustness of the gridding methods was tested in two different regions: (i) the Central European region (CER) which includes Austria, Germany, Switzerland, and adjacent areas; and (ii) the Iberian Peninsula (IP) which includes Portugal, Spain, and adjacent areas. Uncertainties in the gridded maps and the derived error maps were quantified by cross validation. The validation showed high correlations between LST and the target variables Tmin and Tmax, but no noteworthy improvements in the gridding performance if LST was applied as predictor. On the other hand CC showed lower correlations with the target variable, but using CC as a predictor reduced the loss of spatial variability in the interpolated target variable for the Iberian Peninsula.