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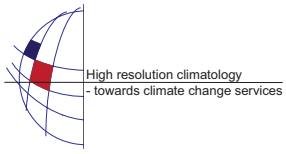

Comparison of the European gridded temperature dataset (E-OBS) with a dataset gridded from a high-density network of stations (GriSt)

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The study compares daily maximum (Tmax) and minimum (Tmin) temperatures in two datasets interpolated from irregularly spaced meteorological stations to a regular grid: the European gridded dataset (E-OBS), produced from a relatively sparse network of stations available in the European Climate Assessment and Dataset (ECA&D) project, and a dataset gridded onto the same grid from a high-density network of weather stations in the area of the Czech Republic (GriSt). We show that large differences exist between the two gridded datasets, particularly for Tmin. The errors tend to be larger in tails of the distributions, and temperatures below the 10% quantile of Tmin – which is still far from the very tail of the distribution – are too warm by almost 2 C in E-OBS on average. A large bias is found also for the diurnal temperature range. Comparison with simple average series from stations in two regions reveals that differences between GriSt and the station averages are minor relative to differences between E-OBS and any of the two datasets. The large deviations between the two gridded datasets affect conclusions concerning validation of temperature characteristics in regional climate model (RCM) simulations. The bias of the E-OBS dataset and limitations with respect to its applicability for evaluating RCMs stem primarily from i) insufficient density of information from station observations used for the interpolation, including the fact that the stations available may not be representative for a wider area, and ii) inconsistency between the radii of the areal average values in high-resolution RCMs and E-OBS. Further increases in the amount and quality of station data available within ECA&D and used in the E-OBS dataset are essentially needed for more reliable validation of climate models against recent climate on a continental scale.