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Quality Control and Homogenization of Monthly Temperatures in Belgium

Charles Delvaux, Romain Ingels, Michel Journée, Vladimir Vrabel, and Cédric Bertrand
Royal Meteorological Institute of Belgium

Long-term, high-quality and reliable instrumental climate records are indispensable pieces of information required for undertaking robust and consistent studies to better understand, detect, predict and respond to climate variability and change. Thanks to a digitization project, climate records are now available from 1880 to nowadays for a number of climatological stations in Belgium (daily maximum and minimum temperatures). However, it is well known that long climatological time series often contain variations that are not only due to the vagaries of the weather or climate. At the same time, wrong or aberrant observations are common in most observational systems. All these factors reduce the quality of original data and compromise their homogeneity. Therefore the identification and correction of these aberrant observations and non-climatic factors are essential before any reliable climate study can be carried out for a meaningful assessment of changes in climate.

This contribution presents the quality control procedures developed at the Royal Meteorological Institute of Belgium to isolate and flag potentially errant values as well as for ensuring internal consistency and temporal and spatial coherence of the daily temperature data. HOMER software along with available metadata was used to homogenize monthly maximum and minimum air temperatures. Homogenization results are provided for 64 series over the period 1950-2015 and for 16 historical series over the full time period (i.e. 1880 to 2015).