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Rescue and quality control of European sub-daily data

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Synoptic and hourly scale observations are crucial for informing regional reanalysis products and improved understanding of fundamental atmospheric processes. Although high-quality daily and monthly scale data are available for much of the European region, many of these higher temporal resolution observations remain in archives or national meteorological services, unable to be used for climate research.

To address this gap in data availability, Working Package 1 of the European Uncertainties in Ensembles of Regional ReAnalyses project (UERRA) identified European regions of poor hourly data coverage in the post-1961 period and located relevant data within various international archives. To date, the project has digitised over five million observations of sub-daily temperature, atmospheric pressure, relative humidity, wind and snowfall.

Here we describe the method of data rescue, preparation and digitisation being used by UERRA, as well as the quality control measures employed to ensure high data quality. Using eastern European and Iberian data sources as examples, we identify some common problems that can occur in the digitisation of such high resolution data, and the techniques employed to minimise these issues.

A range of systematic manual procedures are first used to assess data source quality and continuity. These checks reduce errors at the digitisation stage and provide timely feedback to the digitisation team. A range of semi-automatic quality control tests specifically designed for each variable are then applied, providing details of logical and physical errors in the digitised observations.

These methods and their associated software offer a useful new resource for other projects recovering and digitising high-resolution data, aiding global climate data recovery.

KEY WORDS: Observational data, digitisation, quality control, high resolution data, data management, data recovery.