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Improving the input data to enhance high-resolution regional reanalysis over Europe: the UERRA project contribution

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High-resolution regional reanalysis is a research area of increasing scientific interest and high societal importance. There is an increasing need for the provision of improved and reliable climate services that are required by society to better face the impacts on the socio-ecosystems that climate change and natural climate variability poses worldwide. The EU-funded project titled "Uncertainties in Ensembles of Regional Reanalyses" (UERRA, Grant Agreement 607193: http://www.uerra.eu/) is intended to (1) pioneer and create an ensemble system of regional reanalyses over Europe (ERRA) for weather and climate time scales, (2) assess uncertainties in the reanalysis and (3) develop friendly data services to contribute to future Copernicus' climate change services. Work Package 1 of UERAA on Data Rescue and development and enhancement of gridded and observational datasets is destined to recover, digitize and homogenize historical (last century) synoptic-scale observations over data-sparse regions of Europe.

In this contribution, we assess (1) input data shortcomings, both in time and space, (2)current ERRA (European Regional Reanalysis) products by exploring current data availability in the MARS Archive (at the European Centre for Medium-Range Weather Forecasts) and (3) explore accessible data sources that provide scanned data from different holders, both available online and in physical archives. The focus is placed on the identification of synoptic space and time scale observations for some of the main essential climate variables (e.g. air pressure, temperature, dew point, relative humidity, wind speed and direction, precipitation, snow-depth) that should have a higher impact by enhancing ERRA. Specific details on the Data Rescue's (DARE) effort to be deployed will be provided, along with the coordination efforts with other relevant DARE's activities to avoid duplication. An assessment of the spatial and temporal gaps in the input data for ERRA and the rationale for the emphasis on spatial infilling, but also some temporal infilling, will be provided and discussed.