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Theme 6 [SPACE]

Project: 607193 UERRA

Full project title:
Uncertainties in **E**nsembles of **R**egional **R**e-**A**nalyses

Deliverable D1.6
Homogeneity and homogenisation assessments of station data as they are collected from the NMHSs and from other sources

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WP leader:	URV
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Brief description of the C3/UERRA/QC dataset of spatially homogenised network of synoptic observations developed under UERRA Work Package 1 in accomplishment of Deliverable 1.6 (D1.6)

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The third version (v3) of the C3/UERRA/QC dataset is composed of synoptic observations digitised and subjected to statistical quality control and spatial consistency tests under the EU-FP7-SPACE-2013-1 project (*Uncertainties in Ensembles of Regional Reanalyses*: UERRA. Grant agreement no.: 607193), Work Package 1 (WP1) in the deliverance of D1.6: *homogeneity and homogenisation assessments of station data as they are collected from the NMHSs and other sources*. This dataset has been developed by the Centre for Climate Change (C3) of the University Rovira i Virgili (URV) and contains 8.62 million quality-controlled observations tested for spatial homogeneity for 11 variables recorded at 127 land stations across 15 countries in the UERRA European domain (namely, the Mediterranean region, Central Europe and the Balkans). It spans the period 1877–2012, although larger efforts were placed in the post-1950 period (about 80% of the total data recovered) than for the pre-1950 period (about 20%).

Also included in this deliverable is 175 million subdaily observations that have been gathered in digital format from the national meteorological services (NMS) of Catalonia, Norway, Romania and Sweden. Details of these observations are provided in Table 1.

Table 1. Statistics of data provided by MetNo, SMHI and MeteoCat for UERRA WP1. Variable acronyms represent air temperature (TT), atmospheric pressure (SLP), rainfall (RR) relative humidity (RH), cloud cover (CC), snow depth (SD), wind direction (WD) and wind speed(WS).

Provider	Number of stations	Time period covered	Variables provided	Frequency of observations	Number of total observations
SMHI (Sweden)	146	1945–2009	TT, SLP, RR, RH, SD, CC	Precipitation daily, other observations from 3 times daily to hourly	42.0 million
MetNo (Norway)	93	1960–1980	TT, WD, WS, RR	Generally 3-4 times a day, some stations hourly	7.2 million
MeteoCat (Spain)	76	1988–2015	TT, SLP, WD, WS, RR, RH	Hourly (SD daily)	128.9 million
NMA-RO (Romania)	6	1979–2002	RR	4 times daily	300,000

V3 builds on the data that has been statistically QCed in Deliverable 1.5 (D1.5), and applies a spatial consistency procedure that compares data across neighbouring networks. This process was conducted using an adapted version of the HadISD_v2 QC procedure (Dunn et al., 2012). Only the QCed data from D1.5 were subjected to this procedure, while the data gathered from the aforementioned NMSs were not processed.

Due to the wide geographical spread of the data, the strict requirements of the HadISD procedure, and the heterogeneous nature of the data sources, not all observations were able to be subjected to this spatial homogeneity assessment. About 4.2 million observations (over 48% of the total dataset) could be subjected to spatial homogeneity assessment, resulting in an additional 72499 values (0.8% of the total recovered dataset) being removed. The majority of the errors identified were due to spatial inhomogeneities in temperature and pressure between neighbouring stations, incomplete months, or biased distributions in wind observations, likely due to the conversion of data from qualitative Beaufort scale to m/s.

The C3/UERRA/QCed.v3 dataset is freely and provisionally available at ftp://130.206.36.123 (username: C3_UERRA, password: c3uerra17, folder: D1.6_V3), until Deliverable 1.7 and 1.8 have been produced and delivered. Each file is labeled with the creation date, to show any future updates that may be applied. A data readme and a metadata table with documentation to ensure its full traceability accompany the dataset.

References
Dunn, R. J. H., et al. (2012), HadISD: A Quality Controlled global synoptic report database for selected variables at long-term stations from 1973–2011, *Climate of the Past,* **8, 1649–1679.**