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Creating a next-generation sub-daily data-product for studying extreme events

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To meet the requirements of climate science in the 21st century we need high resolution, high quality, globally complete datasets in near-real time. This demands a highly meticulous approach to data quality control, which must be done in an objective, reproducible and globally consistent manner that enables the quantification of uncertainty. The Met Office Hadley Centre is pursuing the quality control and, at a later date, homogenisation, of 6000+ stations with sub-daily synoptic near-surface temperature data. The data focus mainly on temperature and dew-point temperature but also include sea-level pressure, wind speed and cloud cover. Our automated quality controls address many known issues with observational data including individual and clustered outliers, repeated values, wet-bulb reservoir drying/freezing, frequently occurring values and inconsistency with neighbours. We plan to homogenise the data in due course, but this aspect is still at an early stage of testing methods on synthetic data. Here we will present our quality control techniques, including their performance on encountering real extremes. Our improved data show promise for better analysis of extremes and for the validation of model simulations.