



Access to Baseline and Reference in-situ Observations

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Within the Copernicus Climate Change Service, the activities of the C3S_311A_Lot3 aim to rationalise, harmonise and improve access to open and free observational records and data streams from selected in-situ GCOS-relevant Baseline and Reference observing networks. Essential Climate Variables considered in C3S_311A_Lot3 include surface temperature, atmospheric temperature and humidity (vertical profiles), ozone (column and profiling concentration), wind profiles (from radiosoundings), CO, CO₂ and CH₄ (column concentrations), and water vapour content (columnar from GPS/GNSS only).

The successful implementation of the proposal will allow:

1. The development of consistent quality control algorithms for in situ climate data arising from Baseline and Reference networks at various time scales;
2. The implementation of statistical methods to detect and adjust for inhomogeneity due to issues such as instrumentation changes, physical inconsistencies due to differences in the measurement and processing algorithms, calibration drifts, and observing station relocations;
3. The quantification of the measurement uncertainty in a consistent and metrologically rigorous manner.

This work will provide an overview of the activities ongoing in the first year of the C3S_311A_LOT3 Service Contract 1 which are focused on the vertical profiling of temperature and humidity measured by global radiosoundings networks. GRUAN, as a Reference network, and GUAN, as a Baseline network, will be primarily considered.

Ancillary products specific for the temperature and humidity profiling as well as higher level data products will be also provided, including the vertical smoothing errors, weekly, monthly and seasonal temporal averages, and temporal autocorrelation.

The uncertainties related to the GUAN radiosonde profiles will be estimated exploiting the higher quality and higher vertical resolution of the GRUAN observations. Statistical methods applied to harmonize the GUAN temperature and humidity profiles will be discussed.