5.002 Automatic processing of essential climate variables (ECVs) recorded at different atmospheric observatories in the framework of the NextDATA project.

Early Career Scientist

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Abstract:

The aim of the Project of Interest NextDATA (2012–2018, http://www.nextdataproject.it/?q=en) is to favor the integration of an observational network in Italy, based on measurement stations located in mountain, background and rural regions, for the monitoring of essential climate variables (ECVs). In this framework, we developed and implemented a system for centralized automatic data processing, able to support station personnel towards a more efficient adoption of QA/QC procedures. The system, which could be adopted also outside of the NextDATA project, is composed of several levels. First, raw data (typically collected at 1-min time resolution) from all instruments from different measurements stations (often recorded with acquisition systems that are not standardized between each other) are transferred to the NextDATA server, where they are automatically processed for the harmonization of format and flagging, according to WMO/GAW data-centers guidelines (i.e., creation of level-0 data). Then, all necessary checks for data validity and corrections (e.g., automatic calibration) are applied to the ECVs datasets. Within this phase, also a preliminary automatic data validation process is performed, leading to the creation of level-1 data. Basing on these data screening procedures and corrections, data at native time resolution are then aggregated to hourly averages, to obtain level-2 data. To support the station personnel in the daily QA/QC checks as well as data reporting and interpretation, also a suite of graphic products, based on R codes, is automatically generated. For each ECV, on a daily basis, together with plots reporting the time series of instrumental diagnostic parameters, a suite of elaborations showing time series or time averages over different reference periods (i.e., month, season, year) are produced.