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# The development of a comprehensive metadata of meteorological records as a tool for homogenization procedures: the Ribera d'Ebre county (Northeastern Spain)

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Quality and homogeneity of meteorological data is an essential condition to carry out climatic variability analysis. Unfortunately most of the meteorological records have been affected by non-climatic factors as changes of instruments, exposure and measurement techniques, changes in station location or changes in station surrounding. They all are sources of potential inhomogeneities (abrupt shift or artificial trend) and in consequence we will have serious doubts about the reliability of results if we are not confident about homogeneity of data. For that reason an important number of statistical techniques have been developed to check homogeneity of meteorological records and correct them when necessary and possible.

Although most homogeneity tests are designed to blindly detect breakpoints, the associated errors make necessary to take into account metadata as much as possible. Metadata must be understood as a tool in homogenization procedures for the validation of statistical tests in inhomogeneity detection.

According to WMO recommendations, a comprehensive metadata of meteorological records has been developed for the Ribera d'Ebre county (Northeastern Spain). Meteorological data in this area goes back to the beginning of 20th Century and it seams reasonable that meteorological stations have been affected by several types of incidences having repercussions on their homogeneity and even station continuity. After an exhaustive field and archive work, this study shows that 23 meteorological stations (official networks) have been operatives during the last 100 years but only 14 remain active at the present moment. For each one of them we have documented locations, observers, instruments, rain gauges and screens types, procedures and observational practices and surrounding conditions as well dated changes in any of mentioned aspects. A metadata of meteorological stations with the characteristics of the presented in this study has never been developed before in Spain to our knowledge. This available information about metadata can be very useful to reject some records, detecting erroneous data or inhomogeneities during quality control and homogenization procedures and obviously improving corrections.

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