



Empirical analysis of the differences between AWS data and conventional observations using parallel measurements in Catalonia

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During the last decades, the homogeneity of many long term climate records has been impacted by the replacement of conventional instruments with AWSs. It is arguable how state of the art techniques for the adjustment of daily data can capture and correct these changes. A first step to monitor and evaluate this is to fully understand the actual differences between data simultaneously obtained in an AWS and a conventional instrument at the same recording site.

Here, we employ a network of 7 stations spread over Catalonia, covering coastal areas, the interior plains and the Pyrenees mountains. These stations offer parallel measurements of Tmax, Tmin and precipitation lasting for 5 years (one station) and 12 years or more (6 stations). As a first step, each of the 14 records (7 AWS + 7 conventional) are assessed to ensure the absence of inhomogeneities in the overlap period. The homogeneous sections are compared to empirically describe the differences, accounting for the seasonal cycle and using other climate variables to stratify the differences. This will help to identify the size and shape of the potential inhomogeneities introduced by the Conventional/AWSs replacement and, thus, future experiments which need to create realistic artificial networks to assess the performance of homogenization methods.