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Forecasting the weather
- ensemble techniques
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A monthly precipitation database for Spain (1851-2008): Reconstruction, quality control and homogeneity

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The reconstruction of a single long time series from a number of shorter series belonging to nearby observatories enables the optimization of fragmented precipitation data sets. The reconstruction is based on the hypothesis that the cessation of data recording at one observatory is followed by the establishment of a new observatory very close to the closed one (in many occasions, just in-town relocations). If the observatories are very close, the differences in monthly precipitation amounts are usually very small and data from two or more series can be combined in order to form a very long record series. This series is attributed to the last observatory that is nowadays working and will be probably working in the future. Logically, the resulting combined series can exhibit inhomogeneities which must be identified and removed from further analyses. In order to detect, and adjust for, possible multiple change points or shifts that could exist in the precipitation series, the R-package CLIMATOL V2.0 is used. This method enables to take advantage of the whole Spanish precipitation network in the detection and correction of inhomogeneities. The homogeneity tests are applied on a difference series between the problem station and a reference series constructed as a weighted average of series from nearby stations. The selection of these stations is based on proximity only in order to use the nearest stations even if they have short common period because correlations can not be confidently calculated in this case.
In this study, we present the compilation and a trend analysis of a dataset integrated by 66 long monthly precipitation series, which covers mainland Spain and the Balearic Islands.