



## **Validation of gridded observational and modelled rainfall data in Calabria (southern Italy)**

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Validation studies are of major importance in science, and climate data are no exception to the rule. Metrics are the common tools used to assess data accuracy; it is generally not possible to define generalized metrics, but they must be tailored on the specific use of the evaluated dataset, on the variable used and on the regions of interest.

Calabria (southern Italy) is a challenging area for rainfall studies, because of its complex orography and high vulnerability to climate-change due to its position at the southernmost tip of Italy and in the center of the Mediterranean basin. In this study, we have validated the skills in reproducing rainfall over Calabria of the CHIRPS satellite data, of the E-OBS dataset and of 14 GCM-RCM combined models belonging to the ENSEMBLES project set.

Rainfall data have been validated for the 1951-2010 time period by means of the registrations of 79 rain gauges of the Multi-Risk Functional Centre of the Regional Agency for Environmental Protection (Regione Calabria). Metrics used were the mean error and standard deviation.

The results have shown that the skills of E-OBS, of most ENSEMBLES models, and of CHIRPS (whose data are available only for the 1981-2010 validation period) are very similar. RCMs based on the ECHAM5 Global Climate Model showed slightly better results than both reanalysis and satellite data, both in mean error and standard deviation error. There was no appreciable change in performance for any of the evaluated datasets between the 1951-1980 and the 1981-2010 time periods.

The whole validation-and-assessment procedure, used in this work, is general and easily applicable to any other region where ground data and gridded data are available. The procedure could be applied to develop a more precise risk assessment in those regions with a complex orography and where there is an inadequate amount of representative stations. This validation procedure could be a useful tool in support of policy makers and scientists in decisions related to precipitation risks.