



Comparison between weather station data in south-eastern Italy and CRU precipitation datasets

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Monthly precipitation data in south-eastern Italy from 1920 to 2005 have been extensively analyzed. Data were collected in almost 200 weather stations located 10-20km apart from each other and almost uniformly distributed in Puglia and Basilicata regions. Apart from few years around world war II, time series are mostly complete and allow a reliable reconstruction of climate variability in the considered region. Statistically significant trends have been studied by applying the Mann-Kendall test to annual, seasonal and monthly values.

A comparison has been made between observations and precipitation data given by the Climate Research Unit (CRU), University of East Anglia, with both low (30') and high (10') space resolution grid. In particular, rainfall records, time series behaviors and annual cycles at each station have been compared to the corresponding CRU data. CRU time series show a large negative trend for winter since 1970. Trend is not significant if the whole 20th century is considered (both for the whole year and for winter only). This might be considered as an evidence of recent acceleration towards increasingly dry conditions. However correlation between CRU data and observations is not very high and large percent errors are present mainly in the mountains regions, where observations show a large annual cycle, with intense precipitation in winter, which is not present in CRU data. To identify trends, therefore observed data are needed, even at monthly scale. In particular observations confirm the overall trend, but also indicate large spatial variability, with locations where precipitation has even increased since 1970.

Daily precipitation data coming from a subset of weather stations have also been studied for the same time period. The distributions of maximum annual rainfalls, wet spells and dry spells were analyzed for each station, together with their time series. The tools of statistical analysis of extremes have been used in order to evaluate return values and their space distribution over the considered region.

A procedure for data quality control and homogeneity test on monthly rainfall records is also being applied, while kriging techniques are being developed in order to fully understand rainfall climatology in south-eastern Italy.