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Calabria Daily Rainfall Trends over 1970-2006

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Climate change could modify the hydrological cycle of the Mediterranean Basin, resulting in a reduction of water in the area. In particular, the Italian peninsula shows a negative rainfall trend and prolonged periods of dryness, as that of 1988-1990, could occur in the future. To verify if a change in the hydrological cycle is already detectable in the Calabria region,in the south of Italy, a pluviometric study of the precipitation trend is here analyzed.
The paper focuses on two main aspects of the pluviometric regime over Calabria: a) precipitation trends; b) trends in rainfall extremes. These two topics are studied using a database of 61 raingauges over Calabria, belonging to the network of “Regional Agency for Environmental Protection“. The spatial resolution of the database is about 12 km and the temporal resolution is 1 day. Trends are analyzed for the period 1970-2007.
Results show a non-significant decrease of total rainfall over the peninsula (4.7 mm/year), while the analysis of the stations time series reveals significant (99%) negative trends in some locations.
The Regional Agency for Environmental Protection usually divides Calabria in six sub-regions to better manage severe weather-related events. The precipitation intensity, here defined as the total precipitation amount in one day, is studied for each of the six sub-regions. In all sub-regions is found a negative trend in the heavy rainfall category and a positive trend in the light and moderate categories. These tendencies are correlated with several oscillation patterns, especially with MOI (Mediterranean Oscillation Index).