

## Research Institute for Geo-Hydrological Protection

in the Department of Earth System Sciences and Environmental Technology

an Institute of the Italian National Research Council (CNR)

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# Droughts, desertification and climate change in Calabria, Southern Italy

We have studied the past rainfall trends in Calabria, Southern Italy, and determined their impacts

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Using long-term rainfall records obtained by the rain gauge network of the former Italian Hydrographic Service, in cooperation with colleagues in other CNR Institutes (ISAC and ISAFOM), we have studied the changes in the rainfall regimes in Calabria, Southern Italy.

Applying appropriate statistical methods, we checked the completeness of the historical records, verifying consistency and missing values in the records. We used the obtained databases to assess the monthly, seasonal and annual rainfall trends, and to evaluate the impacts of the variations in the rainfall regime on droughts.

Analyzing daily rainfall records, we evaluated the likelihood of drought periods, characterized by long sequences of days without rain (dry spells).

For areas along the Calabria Ionica, analyzing jointly records of rainfall measurements and data on soil and vegetation, we evaluated the susceptibility to desertification, defined by the UNCCD (United Nation Convention to Combat Desertification) as land degradation due to climate change and human activities.

## Results

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We have shown a clear negative (decreasing) trend of the total annual rainfall in Calabria, with the trends varying in different seasons.

We found changes in the distribution of intra-annual rainfall that may have relevant consequences in the management of the water resources.

The observed decrease in precipitation has an impact on droughts. In recent decades, the observed drought periods were more frequent and more intense than in the past. The return periods of droughts in the 30-year period 1981-2010 were up to half of the return periods in the previous 30-year period from 1951 to 1980. The frequency of drought events has therefore increased.

Our studies show an increased susceptibility to desertification of soils, which is already occurring in areas along the Ionian coast of Calabria.

## Granting institutions

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## To know more

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**Contact Person:** Roberto Coscarelli - [roberto.coscarelli@irpi.cnr.it](mailto:roberto.coscarelli@irpi.cnr.it)



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