Trends of extreme rainfall in Central-East Sardinia.

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Recent studies on climate changes in the Mediterranean area suggest possible increased frequency and/or intensity of extreme events, however it is well known that these kind of results can vary from one area to another, according to the different orography. In this work we present the analysis carried out on daily rainfall time series of 18 pluviometric stations located in Central-East Sardinia (Italy) available from 1951, in order to identify possible trends in the occurrence and intensity of extreme events. Sardinia is an island located in the Western Mediterranean Sea, between 39°N and 41°N latitude, between 8°E and 10°E longitude. Precipitation is a highly irregular phenomenon in the region due to the variability of extratropical cyclones. In particular, the presence of high and steep mountains near the sea on the central and southeastern coast causes an East-West precipitation gradient in autumn especially, due to hot and moist currents coming from Africa. Here the mean annual rainfall reaches up to 1000mm (up to 300mm more than the annual regional mean), and the highest frequency of severe events in Sardinia is recorded. Rain storms following each other at short intervals and with almost the same epicenter often trigger sudden floods causing severe damage, human casualties and geomorphological changes (Cossu *et al.*, 2007). The aim of this work is to analyse the variations of the occurrence and intensity of extreme events with respect to possible changes in the annual precipitation field. Common test for trends are applied to relevant indices and changes in the distribution of daily rainfall (Gamma distribution) and annual maximum (Generalized Extreme Value distribution) are analysed. These results are then confronted with some of the long–term effects in terms of geomorphical impact on the territory in the past few years.

References

Cossu A., De Waele J, Di Gregorio F. (2007) Costal karst geomorphosites at risk? A case study: the floods of 6–11 December 2004 in central-east Sardinia. In Parise, M. & Gunn, J. (eds.) “Natural and Anthropogenic Hazards in Karst Areas: Recognition, Analysis and Mitigation”. Geological Society, London, Special Publications, 279, 85-95.