



## **High-resolution analysis of 1 day extreme precipitation in Sicily**

Maurizio Maugeri (1,2), Michele Brunetti (2), Mistral Garzoglio (1), Claudia Simolo (2), and Andrea Bertolini (2)

(1) Department of Physics, Università degli Studi di Milano, Milan, Italy (maurizio.maugeri@unimi.it), (2) Institute of Atmospheric Sciences and Climate, CNR, Bologna, Italy (m.brunetti@isac.cnr.it)

Sicily, the major Mediterranean island, experienced several exceptional precipitation episodes and floods during the last century, with serious damage to human life and environment. A long term, rational planning of urban development is indispensable to protect the population and to avoid huge economic losses in the future. This requires a thorough knowledge of the distributional features of extreme precipitation over the complex territory of Sicily.

In this study, we perform a detailed investigation of observed 1-day precipitation extremes and their frequency distribution, based on a dense data-set of high-quality, homogenized station records in 1921-2005. We estimate very high quantiles (return levels) corresponding to 10-, 50- and 100-yr return periods, as predicted by a generalized extreme value distribution. Return level estimates are produced on a regular high-resolution grid (30 arcsec) using a variant of regional frequency analysis combined with regression techniques. Results clearly reflect the complexity of this region, and show the high vulnerability of its eastern and northeastern parts as those prone to the most intense and potentially damaging events.