Geophysical Research Abstracts
Vol. 15, EGU2013-5226-1, 2013
EGU General Assembly 2013
© Author(s) 2013. CC Attribution 3.0 License.

A global survey on the seasonal variation of the marginal distribution of daily rainfall

Simon Michael Papalexiou and Demetris Koutsoyiannis

Department of Water Resources and Environmental Engineering, National Technical University of Athens, Greece (smp@itia.ntua.gr)

To characterize the seasonal variation of the marginal distribution function of daily rainfall, it is important to find which statistical characteristics of daily rainfall actually vary the most from month to month and which could be regarded to be invariant. Relevant to the latter issue is the question whether there is a single model capable to describe effectively the nonzero daily rainfall for every month and at every area of the world. To study these questions we perform a massive analysis approximately of 170,000 monthly daily rainfall records at more than 14,000 stations from all over the globe. The analysis indicates that: (a) the shape characteristics of the marginal distribution of daily rainfall, generally, vary over the months, (b) commonly used distributions like the Exponential, the Gamma, the Weibull, the Lognormal, or the Pareto, etc. are incapable to describe "universally" the daily rainfall, (c) exponential-tail distributions like the Exponential, mixed Exponentials or the Gamma can severely underestimate the magnitude of extreme events and thus they constitute a dangerous choice, and (d) the Burr type XII and the Generalized Gamma distributions are two good models, with the latter performing exceptionally well.