Heavy-tailed Distributions In Disaster Analysis

Mathematically, natural disasters of all types are characterized by heavy tailed distributions. The analysis of such distributions with common methods, such as averages and dispersions, can therefore lead to erroneous conclusions. The statistical methods described in this book avoid such pitfalls. Seismic disasters are studied, primarily thanks to the availability of an ample statistical database. New approaches are presented to seismic risk estimation and forecasting the damage caused by earthquakes, ranging from typical, moderate events to very rare, extreme disasters. Analysis of these latter events is based on the limit theorems of probability and the duality of the generalized Pareto distribution and generalized extreme value distribution. It is shown that the parameter most widely used to estimate seismic risk Mmax, the maximum possible earthquake value is potentially non-robust. Robust analogues of this parameter are suggested and calculated for some seismic catalogues. Trends in the costs inferred by damage from natural disasters as related to changing social and economic situations are examined for different regions. EAN/ISBN : 9789048191710 Publisher(s): Springer Netherlands, Springer Science & Business Media Format: ePub/PDF Author(s): Pisarenko, V. - Rodkin, M.

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