



Analysis of fire size distribution in Portugal

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In this work we have applied statistical methods to characterize the variability of forest fires in Portugal, and additionally assess the role of meteorological conditions on fire size.

Appropriate distribution functions were tested to fit the high positively skewed fire size samples. Maximum Likelihood Estimates (MLE) of distribution parameters were derived from a 28 year database of fire occurrences and the goodness of fit was assessed by standard Kolmogorov-Smirnov, Crámer von-Mises and Anderson-Darling statistical tests as well as by qq-plots. Weather conditions, namely air temperature, precipitation and wind have significant influence on vegetation physiological state and the impact on fire size was studied by using these variables as meteorological covariates of the above derived statistical distributions.

The following datasets covering the 1980-2007 period were used: 1) the Portuguese Rural fire database, provided by the Forest National Authority and 2) daily values of meteorological variables, as well as atmospheric circulation indices as obtained from weather typing analysis and fire risk indices. The methodology was applied considering all fire records in the database and fires registered in particular periods and/or locations. Results reveal the usefulness of parametric models to characterize the observed fire size distribution and to assess the role of meteorological conditions on fire size distribution.