Socioeconomic influence of natural disasters in the Western Balkan countries

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The Western Balkan region is a region of south-eastern Europe that presents pronounced activities of various types of natural hazards and natural disasters. This paper analyses data sets from two international databases of the main types of natural disasters namely geophysical, hydrological, climatological and meteorological disaster events during the period 1900-2008. The following have been analysed: the number of natural disaster events, natural disaster occurrence by disaster type, the total number of fatalities, the total number of affected people and the corresponding economic damages expressed as a percentage of selected types of natural disasters. The data analysis in this paper aims to confirm the importance of data collection and analysis as a foundation for planning and preparing disaster reduction programs for the Western Balkan countries.

Statistical methods applied to aftershock sequences

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Temporal distribution of triggered seismicity following a strong earthquake has been the subject of many studies that focus on applying statistics to earthquake sequences. The earthquake occurrence can be described by stochastic processes and therefore probabilistic models are developed in order to assess the seismicity rate changes resulted after a strong event. The several statistical methods that serve this purpose are based on different assumptions. The seismicity rate changes during three earthquake sequences that took place in the territory of Greece are investigated. The first is the 1981 Corinth Gulf seismic sequence, with three strong (M=6.7, M=6.5 and M=6.3) events between February 24 and March 4, the second one the 2001 Skyros Island sequence, with the main shock occurring on July 26 with M=6.3, and the last one the 2003 Lefkada Island, with a main shock of M=6.2 occurring on August 14. An attempt is made for modeling the aftershocks, as they comprise a major portion of an earthquake catalog including important information about the rate changes. Firstly, a homogeneous Poisson model is tested to fit the data, with the waiting times of the point process being exponentially distributed and the rate λ of the Poisson process constant in time. The process has no memory and any particular event is regarded as unrelated to any other. Substituting a function $\lambda(t)$ for the rate λ leads to a non–homogeneous Poisson process with intensity function $\lambda(t)$. In this case the rate parameter is time dependant and the appropriate form of the function has to be chosen in order to describe the way seismicity rate evolves with time. In the present work two forms were tested, both allowing the rate decaying as time passes. The first one is an exponential function with two unknown parameters, whereas the second one is a non-homogeneous Poisson process with a Power Law intensity function $\lambda(t)$. Because of the rate's form the particular model is also known as a Weibull process. The third statistical method applied to the data is the Autoregressive model of second order (AR(2)), which is used in time series analysis to describe stationary time series, and is a linear regression of the current value of the series against two previous values of the series. In order to apply the AR model to the above earthquake sequences, a random variable Z(t) was