



Operational network improvements and increased reporting in the NOA (Greece) seismicity catalog.

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Earthquake catalogues are the basic product of seismology and of extreme importance for the assessment of seismic hazard. These data sets contain both, natural and man-made, changes. For example, seismological networks may improve their detection ability by the addition of more stations, by changing station locations for a better signal to noise condition and by improving the signal processing and analysis of seismic events. These man-made artifacts are apparent changes of the seismicity rate in earthquake catalogues and they mask the determination of real tectonic seismicity patterns.

The earthquake catalog of the Institute of Geodynamics of the National Observatory of Athens (NOA) is the most detailed data set available for the Greek area containing more than 150,000 events since 1964. During this 49 year period, many changes occurred in the processing, analysis and reporting procedures, as well as changes in the configuration and infrastructure of the seismological network, however the method of the magnitude determination remained undisturbed. In February 2011 major improvements were implemented in the standard procedure for analysis and reporting at NOA and most important was the change in the method and procedure for the earthquake magnitude determination.

In this investigation we will demonstrate the artificial seismicity increase in the earthquake catalog of NOA due to the recent improvements in the analysis and reporting. The results indicate a significant change in the magnitude of completeness of the earthquake catalog from a value of $M_c \sim 3$ prior to 2011, to a value of $M_c \sim 2$ after February 1st, 2011, mainly attributed to the registration of significantly larger number of events of smaller magnitudes. In order to maintain the homogeneity of the magnitudes reported throughout the NOA catalog, synthetic frequency-magnitude distributions are employed to determine the required conversion constants.