Ετήσια Επιστημονική Συνεδρία 2015
2015 Annual Scientific Meeting

Τετάρτη 13 Μαΐου 2015
Wednesday, 13 May 2015

Τεύχος Περιλήψεων
Abstracts Volume

Αμφιθέατρο «Ι. Δρακόπουλος»
Τμήμα Γεωλογίας και Γεωπεριβάλλοντος
Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών
ARRANGEMENT OF GEOSPATIAL INFORMATION TOWARDS DEVELOPING A SEISMIC RISK EWS FOR THE LEFKADA OLD TOWN.

Kalantoni D., Kassaras I. and Makropoulos K.

Department of Geophysics-Geothermics, Seismological Laboratory, National & Kapodistrian University of Athens, Panepistimiopolis, Zografou 15784, Greece, email: dkalantoni@geol.uoa.gr

Nowadays, Early Warning Systems (EWSs) are of great importance for urban seismic risk and emergency management. In this work, we describe the development and combination of a series of approaches for constructing a database of earthquake spatial effects towards creating an EWS for the Lefkada old town, situated in one of the most seismically active areas of the Mediterranean region. The geospatial information presented regards the earthquake damage probability at the target site and it is derived from seismic scenarios developed by combining seismic sources, vulnerability of buildings and site effects.

Vulnerability was assessed empirically for individual buildings through a field survey. Site effects were determined using dense ambient noise HVSR measurements at selected points in Lefkada old town and available data from geotechnical boreholes. 1D viscoelastic soil models were determined for each point by inverting the HVSR curves using a Monte Carlo approach. Peak ground acceleration was assessed at each point using the point-source stochastic simulation scheme, by applying the site amplification deduced from the 1D viscoelastic models. Seismic risk scenarios were developed assuming two seismic sources (a) the earthquake on August 14th 2003 with M6.2 at a distance of 13 km from Lefkada old town and (b) a future nearest maximum credible earthquake with M7 at the same distance.

The discrete damage probability was resolved by formulating a beta distribution of an average damage grade related to the vulnerability and the simulated PGA through empirical equations. The obtained models are found to be comparable with co-seismic observations during the 2003 earthquake and hence they are likely appropriate for preparing future emergency plans for the target site. An adaptable Arc-GIS automated procedure to map earthquake damage scenarios is currently being developed by implementing the above mentioned methods.