

EARTHQUAKE HAZARD IN MARMARA REGION AND ISTANBUL CITY: A REVIEW

Haluk EYİDOĞAN¹

Adres: ¹Istanbul Technical University, Department of Geophysical Engineering, İstanbul Turkey

E-posta: eyidogan@itu.edu.tr

ABSTRACT Earthquake hazard has become one of the most important issues for İstanbul City after shocking results of 17August 1999 Kocaeli earthquake. Recent geological and seismological studies reveal strong clues about the western migration of stress field along the western extension of North Anatolian Fault that may cause a large earthquake in Marmara Sea, south of İstanbul metropolitan area.

Almost a dozen of earthquake hazard maps for Marmara region that are obtained using both deterministic and probabilistic methods have been published after 1999. In this presentation a review of these hazard studies will be given. Inconsistencies exist between seismic hazard values of expected 'big' earthquake in the Marmara region. The major changes are due to location, size, seismic characteristics of source zones and attenuation equations. The general agreement is on the size of expected earthquake, and the probability of occurrence of $M \geq 7$ earthquake is very high. The expected rate of maximum acceleration (PGA) along the southern coast of İstanbul ranges between 0.25 g and 0.6 g.

The characteristics of seismic source zones, methodology and attenuation are the major factors that have an considerable effect on the hazard values. A 'consensus' is needed on these arguments. A new hazard map that will be satisfactory in scale, content and methodology should be prepared to serve for land-use and microzonation applications. Reliable historical earthquake data base should be constructed. Sound physical data is requisite for a reliable rupture model. Multidisciplinary national and international joint projects on marine geology and geophysics in the Sea of Marmara region as well as monitoring the micro-earthquakes are highly recommended to understand the kinematics of the recent seismo-tectonic activity. The number of acceleration recorders should be increased in order to develop more realistic local attenuation equations.