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Earthquake Scenarios and Comparison with Historical Earthquakes, Hatay Region, SE Turkey

S. Uskuplu and O. Tuysuz
Eurasia Institute of Earth Sciences, Istanbul Technical University, Istanbul, Turkey (tuysuz@itu.edu.tr)

Hatay Province (Antioch on Orontes) and its surroundings, SE Turkey, have been studied in this research. Tectonically, the East Anatolian Fault Zone (EAFZ), Dead Sea Fault Zone (DAFZ) and Cyprus Arc juxtapose in this region and form a triple junction. Historical records, which extend back to 300 BC, indicate that repeated destructive earthquakes affected this historical region for many times. It is still a matter of debate in this region that which fault produced these earthquakes. It is indisputable for this region that the probability of occurrence of future big and destructive earthquakes are quite high. For that purpose, the damage distributions of the historical earthquakes of this region, which are compiled from various catalogues, have been investigated in this study. The active faults in the region are determined by field studies and the maximum magnitudes of the earthquakes that can be produced by those faults are calculated by using empirical formulas. In the next step we produced synthetic earthquake scenarios by using Geographical Information System (GIS) analysis techniques to estimate the damage distribution of earthquakes that would possibly be produced by different fault segments. In the last step we compared results of damage distribution of synthetic earthquake scenarios with the damage distribution from historical records. Based on these results we tried to estimate which fault segment produced which historical earthquake.
Results of our study indicate that the historical earthquakes in the Hatay Province were mainly produced by different segments of the Dead Sea Fault, and the Antakya-Samandag Fault.
Keywords; Earthquake scenarios, GIS, historical earthquakes, Hatay, intensity