

## 5. SEISMO-TECTONICS OF ÇUKUROVA BASIN

The Çukurova Basin was assigned to the second and third degree zones on the seismic risk map of Turkey prepared by the Earthquake Research Department of Turkey until recently (Ergunay and Gülkan 1993). This seismic risk map was revised in 1997 in view of the publication map of active faults map of Turkey by MTA (Mineral Exploration and Investigation Institute) in 1995 (Figure 5.1). As a result, the Çukurova Basin has been now assigned to the first and second degree zones of seismic risk. The boundary between the first and second degree zones passes nearby Yumurtalık-Karataş fault.

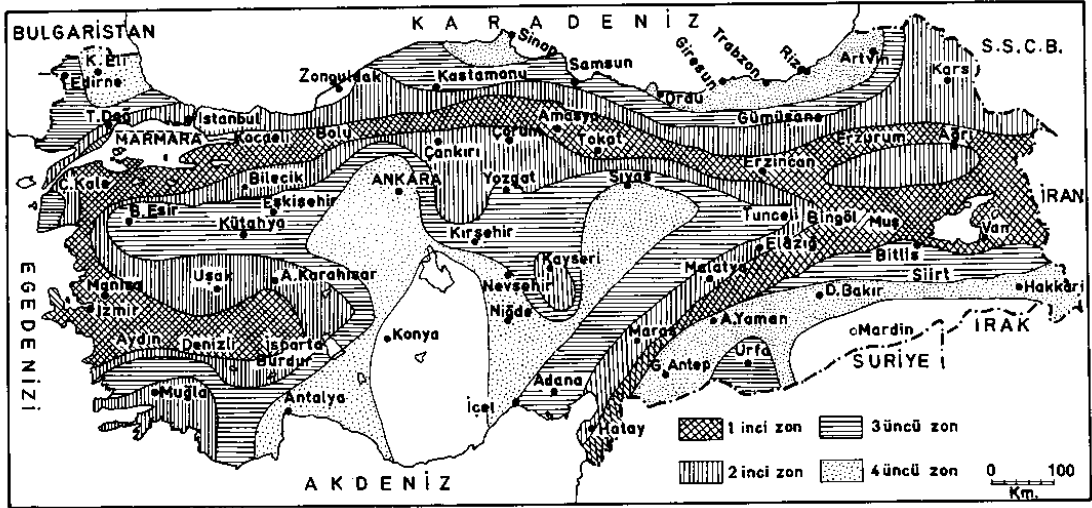
The Eastern Anatolian Fault Zone is known to be less active as compared with that of the NAFZ and WAFS due to the kinematics of westward moving and anti-clock wise rotating Anatolian plate. In other words, the Eastern Anatolian Fault Zone waits until restraints are eliminated by the earthquakes on the NAFZ and WAFS. When it is activated, its activity continues for a certain period of time on the basis of data catalogues compiled and published by Ergin et al. (1967) and Öcal (1968). When the earthquake activity of Adana province and its close vicinity is taken into account on the basis data from these earthquake catalogues, it seems that there exist a periodicity of 800 years for events with a magnitude of 7 or greater than 7.

Figure 5.2 shows the distribution of epicenters of earthquakes observed in the Çukurova Basin and its close vicinity. It seems that earthquakes are generally associated with known active faults existing in the region.

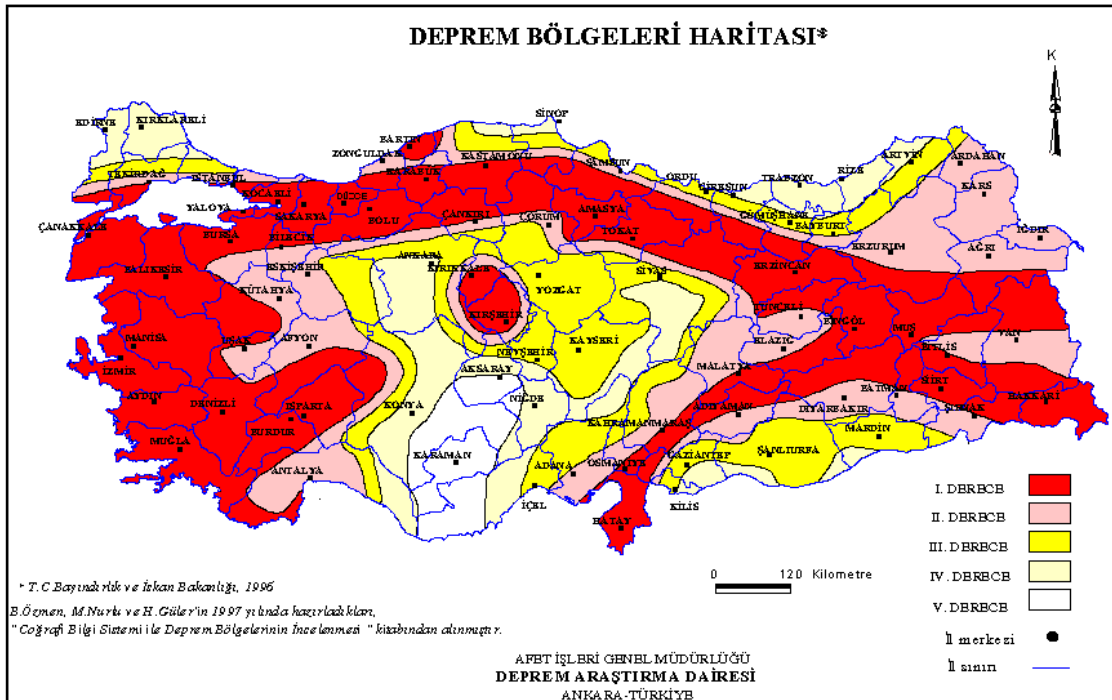
Gençoğlu et al. (1990) investigated the seismic risk of each province of Turkey. Figure 5.3 shows the relation between the magnitude of earthquakes and recurrence frequency on the basis of data of earthquakes for a period between 1881 and 1986. Using these data, they suggested the following relation for the provincial earthquake recurrence

$$\log N = 3.42 - 0.51M$$

An earthquake with a magnitude of 5.7 occurred at Misis (Yakapınar) on March 20, 1945. Using the above formula for an earthquake with a Richter magnitude of 6, they computed a value of 57.9 years for earthquake recurrence. It seems that the above formula holds for the earthquake recurrence in Adana province when the earthquakes of March 20, 1945 and June 27, 1998 are considered.



(a) Previous seismic risk map



(b) Revised seismic risk map

Figure 5.1 Seismic risk map of Turkey

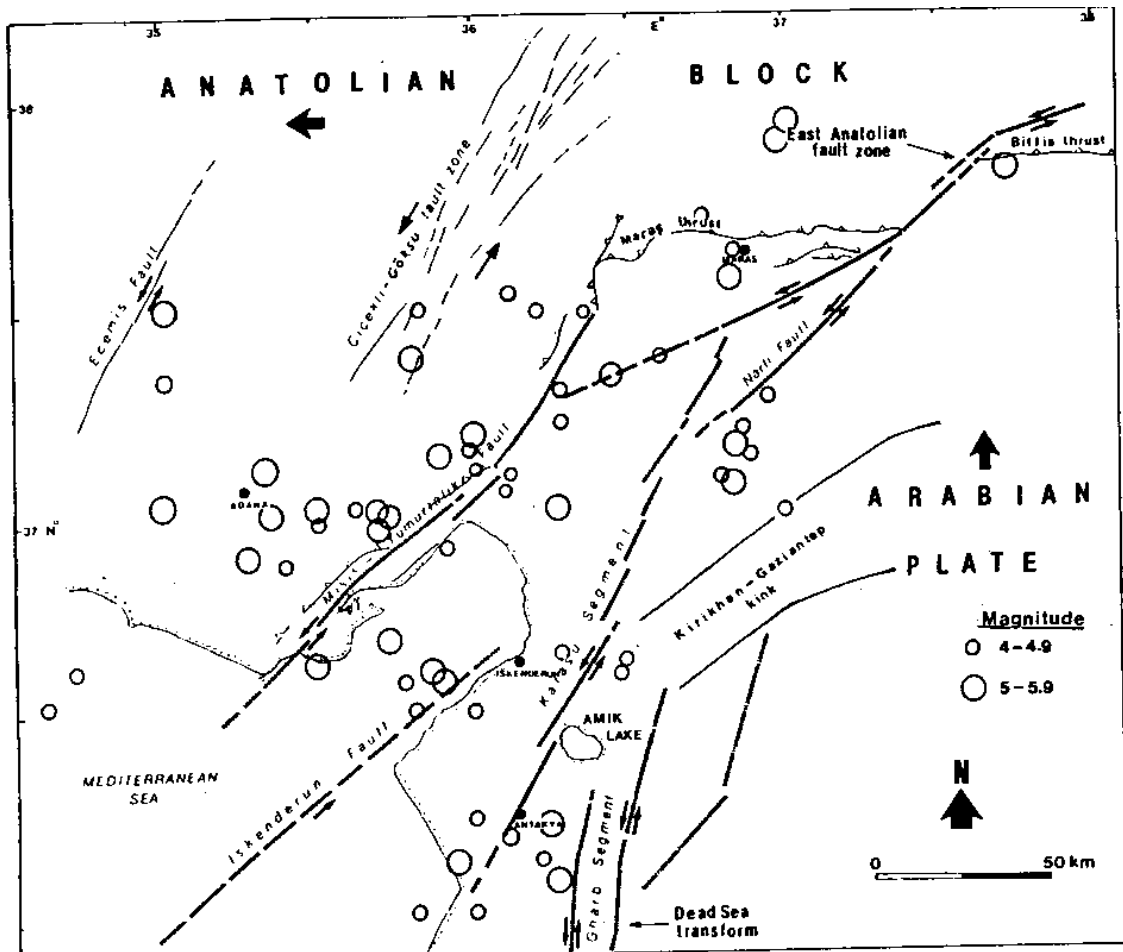


Figure 5.2 The distribution of epicenters of earthquakes observed in the Çukurova Basin and its close vicinity (after Gülen et al. 1987)

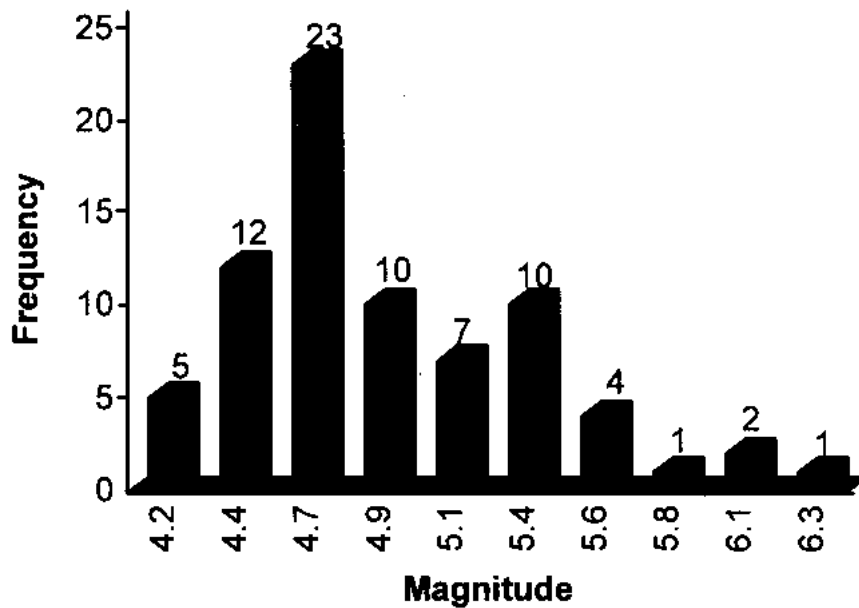


Figure 5.3 Magnitude-frequency relation for earthquakes in Adana province (after Gençoğlu et al. 1990)