

## 1. INTRODUCTION

An earthquake of magnitude 6.3 on the Richter Scale occurred at 16:56 (13:56 GMT) on local time on June 27, 1998 in Adana province in Southern Turkey, which was subjected to big earthquakes in the past ( $M_s=6.1$  and  $M_s=5.2$  at Ceyhan-Misis region on March 20, 1945 and October 22, 1952, respectively) and situated on the famous *EAST ANATOLIAN FAULT ZONE* (Figure 1.1). This earthquake is officially called *Adana-Ceyhan Earthquake*. Turkish Earthquake Research Department (ERD) estimated that the epicenter of the main shock was about 38 kilometers away from the centre of Ceyhan town. The peak ground accelerations were 0.28g in E-W, 0.22g in N-S, and 0.08g in vertical directions (ERD). Following the earthquake on June 27, there were numerous aftershocks of intensive ones. According to preliminary reports, the earthquake caused the loss of lives more than 145 and injuring more than 1500 people. 7 major buildings were totally collapsed, 30 residential buildings, 5 office complexes and 6 schools were heavily damaged. This earthquake caused severe structural damages in Ceyhan town, and the villages including Geçitli, Yakapınar (Misis), Abdioğlu, Kılıçlı, Sulucak, Cihadiye, Kızıлтаş, and Adana Organized Industrial Zone located between Adana and Ceyhan. The main earthquake was also been felt in Mersin, Niğde, Nevşehir, Aksaray and Osmaniye. Estimated economic lost due to only structural damages is about 60 billion Turkish Lira. Local people left their damaged homes and moved to tents or neighboring cities.

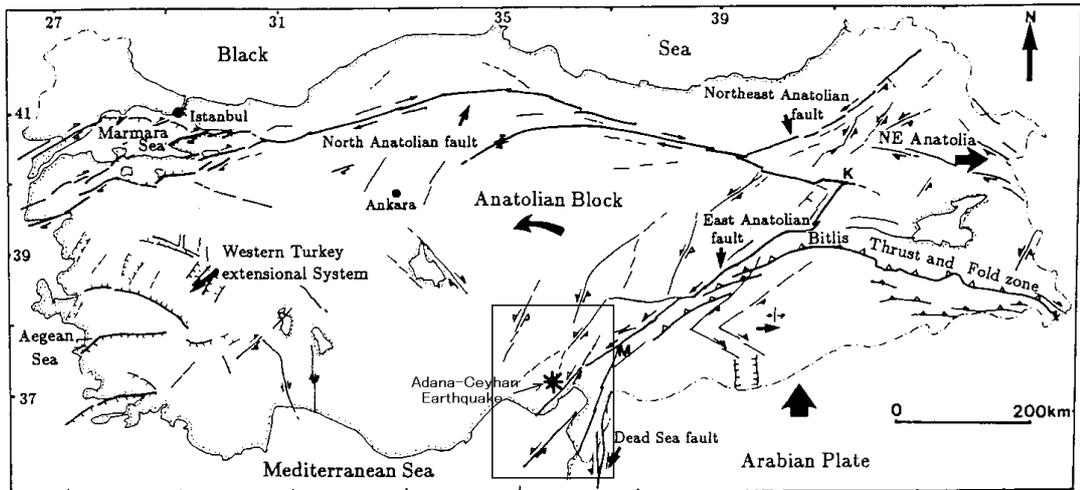
The number of the floors of the collapsed or heavily damaged apartment blocks was more than 5. Many minarets of masonry type were toppled and such a collapse at the mosque of Geçitli Village killed 5 people who were praying at that time in the mosque.

There were some damage to bridges. The damage at the historical Lokman Hekim Bridge of masonry type, spanning Ceyhan River was quite heavy. The damage was likely to be caused by the permanent displacement of ground due to faulting beneath.

Ground liquefaction was wide-spread and was observed at locations along the Misis-Andırın fault and it extended to distances up to 50 km from the hypocenter.

Figure 1.2 shows some newspaper clips on the Adana-Ceyhan June 27 Earthquake. Figure 1.3 shows a satellite view of Çukurova Basin. Seyhan river is in the west and Ceyhan river is in the east and they flow through the Çukurova basin. As seen from this satellite view, the Çukurova basin is covered with extensive alluvial deposits as indicated by red coloured areas.

This report outlines the investigation undertaken by the investigation team on various aspects of the earthquake in Ceyhan-Misis region occurred on the 27<sup>th</sup> June, 1998. This investigation was carried out between 11 and 14 July, 1998. An additional investigation was also performed between 16 and 18 August, 1998. In the first half of the report, geology, hydrogeology, tectonics and seismotectonics of the Çukurova basin are outlined from a general perspective view of those of Turkey. The second part involves site observations, measurements, computations, laboratory testing and evaluation of the finding from these investigations.



(a) Location of the affected region by the earthquake



(b) Provincial boundaries

Figure 1.1 Location of the earthquake region

**Milliyet**

MILLİYET 199

**Post eden deprem**

**6.3'ün sabahı**

Deprem 113 kuzey ve güney Adana 62'nin yarısını sarsıntı, çökme, çukurlu ve yıkılmaya yol açtı.



**Hürriyet**

**Özlediğimiz devlet**

1.5 milyon insanı etkileyen Adana ve çevresindeki büyük depremde, 20 bin kişinin öldüğü 2 yıl önceki Dinar depremindeki kargaşaya yaşanmadı.



**Depremzedeye kira yardımı**

ADANA, Turkey (AP) - An earthquake that rattled this southern city Saturday killed at least 288 people and injured about 1,000, news reports and witnesses said.

**トルコ南部で地震**

死者100人以上、800人けが

【エルサレム28日路透電】トルコからの報道によると、同国南部での午後5時（日本時間同日午後5時）マグニチュード6.3の地震が発生し、壊れた家屋の下敷きになるなどして少なくとも100人以上が死に、約800人が負傷した。

最も被害が大きかったのは、トルコ東部、地中海沿岸の人口90万の主要工業都市、アダナ。労働者の密集した住宅が相次いで倒れ、死者は40人以上に上りまわった。トルコ当局は28日朝から生存者の救出作業を本格化した。

**Quake kills at least 108 in Turkey**

ADANA, Turkey (AP) - An earthquake that rattled this southern city Saturday killed at least 288 people and injured about 1,000, news reports and witnesses said.




**トルコで地震 死者100人超す**

【アンカラ28日】青山新聞】トルコ南部の17日午後5時（日本時間同日午後11時）6.3、強い地震があり、少なくとも100人以上が死に、約千人が負傷した。イスタンブールの新聞所によると、地震の規模はマグニチュード6.3で、震源は首都アンカラから南約400キロにあるアダナ付近。この地震により、アダナ近郊の町では、少なくとも四つの建物が倒壊し、多数の人ががれきの下に埋まった。トルコ南部の沿岸部やキプロスでも揺れが感じられた。被災地では、生存

Figure 1.2 Newspaper clips

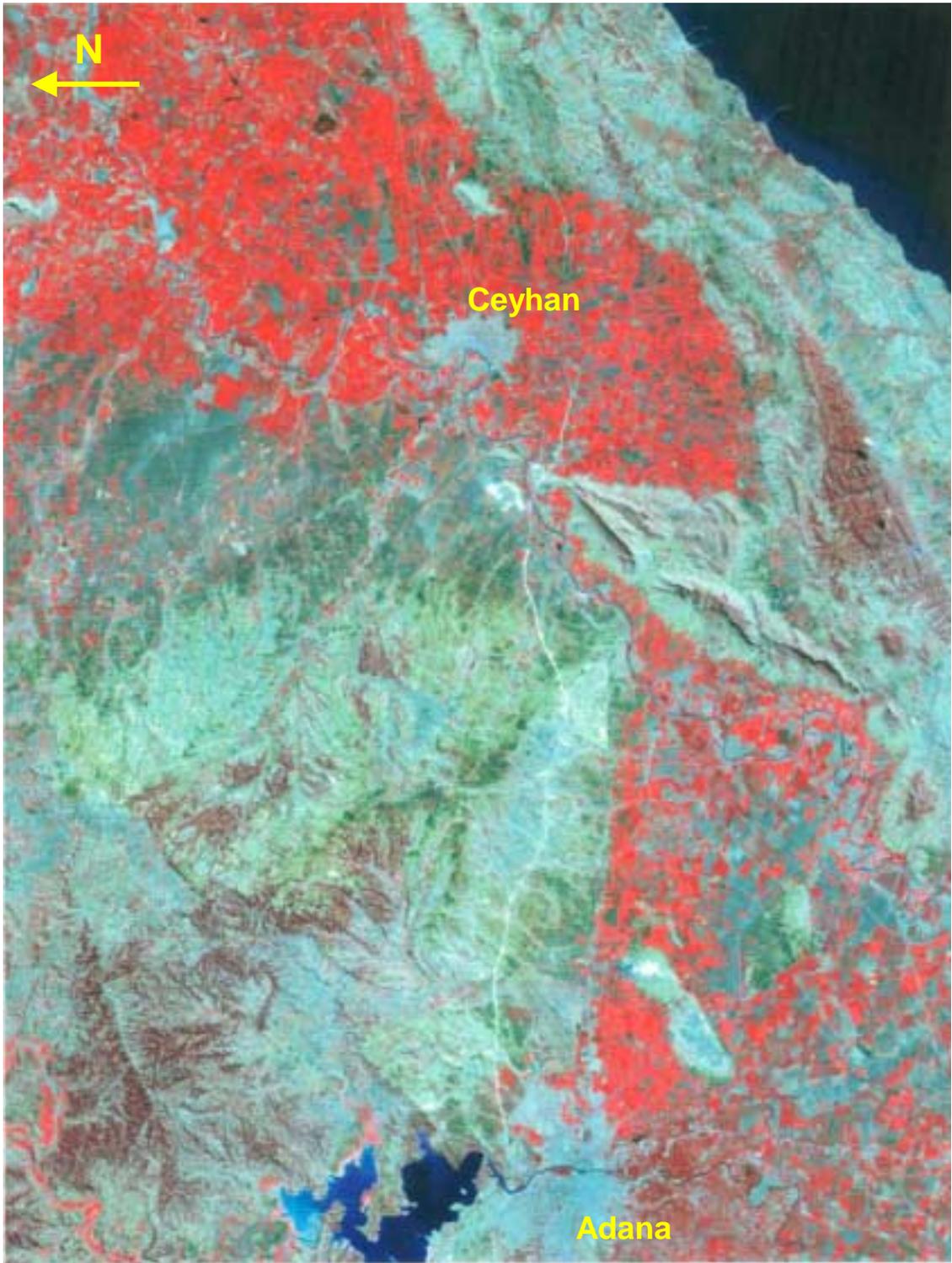


Figure 1.3 A LANDSAT view of the earthquake region