

Learning from Earthquakes

January 8, 2006, Kythira Island (Greece) 6.8 Earthquake

On January 8, 2006, at 13:34 local time (11:34:55 UTC) a strong earthquake with a moment magnitude of 6.8 occurred in southern Greece. The earthquake was felt throughout Greece and in nine countries along the eastern Mediterranean from Italy to Egypt. Following the earthquake, EERI members Professor G. Danamos and Dr. E. Lekkas of the National University of Athens conducted a field investigation.

The earthquake epicenter was located on the island of Kythira (36°20' N, 23°20'E), with focal depth of 66 km (USGS). The earthquake was followed by 16 aftershocks during the next three days with a maximum magnitude of Mw 5.5. No casualties were reported during the earthquake or the aftershocks, and the only damage was to infrastructure in the area of Kythira, Antikythira, and the city of Hania in western Crete.

The main earthquake and the aftershocks were caused by the active subduction zone located in the Hellenic Arc region along the Aegean Sea Plate. This plate is moving to the southwest at 40-60 mm/yr and is colliding with the African plate.

Most of the damage on the island of Kythira was in the central part of

the island at Mitata village. However, modern buildings that included reinforced concrete columns underwent no damage, not even to wall surfaces. Serious damage was only found in stone masonry structures. The most characteristic damage was recorded at the church in the center of the village. The church was constructed of porous limestone blocks cemented with lime wash without reinforced concrete columns. Damage occurred at the two bell towers because (1) they represent construction that was added to the main building at a later date, and (2) the different height and mass led to out-of-phase vibration that caused the detachment of the two sections.

Secondary geodynamic effects triggered by the earthquake included rockfalls and landslides along the local network of roads. The most impressive landslide was located at the Mitata village square with a collapsed volume estimated to be 5,000 m³. The event caused the detachment of large masses of rock with an approximate volume up to 500 m³ each along the road between Mitata village and Viaradika village. As a consequence of the landslide on the upper section of the slope, a section of the Mitata village square was detached. At the base of the slope a section of the road from Mitata to Biaradika was damaged.

No surface fault ruptures were found

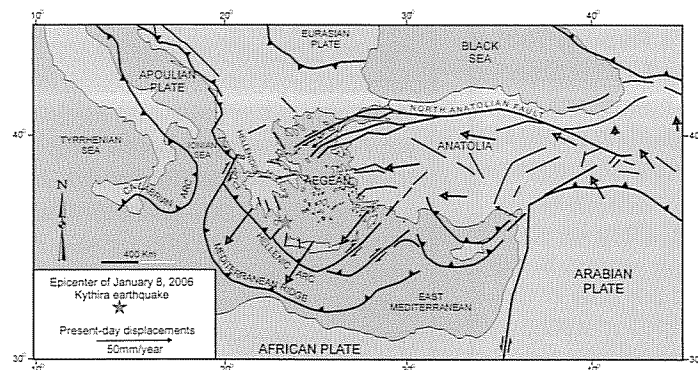
as a result of this earthquake. The only ground ruptures were caused by the lateral instability of the formations near morphological discontinuities. Unconsolidated formations dominate along the coastal area of the island, and no evidence of liquefaction was found as a result of this earthquake.

The full report by this investigation team as well as another report from the Institute of Engineering Seismology and Earthquake Engineering in Thessaloniki can be found at <http://www.eeri.org/lfe/greece.htm>. A USGS report can be found at http://neic.usgs.gov/neis/eq_depot/2006/eq_060108_hrak/neic_hrak_ts.html.



Landslide at Mitata (Photo: E. Lekkas).

Mitata village church
(Photo: E. Lekkas).



Location and tectonic setting of the 1-8-06 earthquake.

