

Coastal geo-hazards around the Mediterranean Sea and disaster risk reduction

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“Neptune raises up huge waves and floods the countryside of Troy”

The Metamorphoses Book XI

ABSTRACT

The Mediterranean region is one of the high risk areas in the world, as it attracts millions of tourists all the time of the year. According to historical records, many powerful events have taken the lives of thousands over the ages and affected disastrously the coastal civilizations and economies, even leading to the collapse of cultures. As more and more people choose to live along high-risk coastal areas, the region faces the possibility of large economic losses from structural and non-structural damages along densely populated coastlines. Tsunami warning systems, public awareness, risk mitigation strategies, planning and mitigation measurements are the ultimate goal to build “*coastal disaster-resilient cities*” around the Mediterranean region.

DEVASTATING COASTAL GEO-DISASTERS AROUND THE MEDITERRANEAN SEA

The shorelines along southern Europe and northern Africa, from Spain, Algeria, Italy, Greece, Turkey, Egypt to Israel are affected by earthquakes, volcanic eruptions and collapses, mass failures generated by great fault zones and subduction systems in the area (Tinti, 2003; Mascle, this volume). Paleotsunamigenic sediments identified along the coasts of Italy, Greece and Anatolia indicate that the region has been repeatedly affected by tsunamis (Vött *et al.*, 2009; De Martini *et al.*, this volume; Sakellariou, this volume). Troy (Papadopoulos, 2009), Myous, Magnesia (Brückner *et al.*, 2003), Cnidus, Miletus, Priene, Ephesus (Altunel, 2003) were major ancient Aegean coastal cities which were frequently hit by the earthquake associated tsunamis (Altnok *et al.*, 2001; 2011; Sakellariou and Lykousis, 2003; Yolsal *et al.*, 2007).

In 1628 B.C. the coasts of the eastern Mediterranean were flooded by huge waves of up to 60 m high caused by a volcanic eruption on Santorini in the Aegean Sea. A major destructive earthquake in A.D. 365 had caused coastal uplift 9 m of more than 100 km long area in Crete and produced a tsunami which destroyed complete coastal regions as far as Cyprus, Libya and Sicily (Stiros, 2010), and reached the Egyptian coast, killing 50,000 lives in Alexandria. The best documented and most recent tsunamigenic earthquake in the Aegean Sea is the one that occurred near the Amorgos Island in 1956, killing 53 people, injuring 100 people and destroying hundreds of houses. The waves were reported to be almost 25 m high. A distinctive tsunami-prone area is associated with earthquake zone around Chios Island in the eastern Aegean Sea (Papadopoulos, 2009).