

Şarköy-Mürefte 1912 Tsunami and the Estimation of Underwater Failures in the Sea of Marmara

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The earthquake 9 August 1912 (01:29:00 UTH) in Gregorian calendar is one of the largest earthquakes in the Balkans (Ms: 7.3). It corresponds on 6-7 Ramadan 1331 depending on the Hegiria Calendar and on 26-27 Temmuz 1328 depending on the Ottoman Calendar. It is also known as Şarköy-Mürefte Earthquake or Saros-Marmara Earthquake (Ambraseys and Finkel, 1987). The earthquake which occurred on the northern strand of the North Anatolian Fault (NAF) zone was felt within a 400 km radius circle, namely from the cities of Sofia to Bolu and from İzmir to Bucharest. The earthquake totally destroyed 12,600 houses and caused enormous losses in the cities of Şarköy, Mürefte, Gelibolu and Çanakkale, resulting more than 2800 deaths and 7000 injuries.

A tsunami took place during the course of the 1912 Şarköy-Mürefte earthquake. It was effective both in the near and the far field. In near field a dense sulphur smell has come out of the sea around Şarköy and thin petroleum layer has been observed on the sea surface along the shores of Gaziköy. The sea receded in front of the Tekirdağ coastline and then it returned back forcefully but causing no damage in practice. The waves damaged the sea vessels anchored along the coast of Şarköy and Mürefte. The far field effects were reported mainly from Istanbul which is the most popular and crowded city in the Sea of Marmara region. Some wave movements, for example, were observed along the shores of Kadıköy (İstanbul) just before the earthquake. In addition to high level of sea water occurred in the Bosphorus as a consequence of the earthquake, some abnormal tsunami waves were observed along the Bosphorus channel, especially in the Paşabahçe bay. The tsunami waves, however, were the most effective along the Yeşilköy coasts with an observed run-up of 2.7 m. By considering known unusual effects of the related tsunami and from bathymetric and geophysical data from the Tekirdağ trough, the mechanism of the tsunami may be assigned to an underwater failure. Therefore, the tsunamigenic potential of co-seismic underwater failures in the Sea of Marmara should not be underestimated.