



Analysis of the October 30th, 2020 Aegean Sea Tsunami towards Future Tsunami Preparedness

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The coastal settlements in the Aegean Sea coast have experienced numerous tsunamis throughout history due to the frequent earthquakes of different magnitudes. Three normal-faulting events have been recorded over the last four years, confirming the tsunami threat in the NEAM region. The June 12th, 2017 (Mw 6.3) and July 20th, 2017 (Mw 6.6) events in the Eastern Aegean affected the nearby coastal areas and served as reminders, the latter causing remarkable loss of property and boat damage in Bodrum, Turkey and Kos Island, Greece.

On October 30th, 2020, a strong earthquake (Mw 6.6, AFAD, 2020) caused substantial structural damage at 75 km epicentral distance in the Bayraklı region resulting in 117 casualties. A tsunami was also generated, causing very strong motion in the nearshore shallow areas and small craft harbors along 130 km shoreline from Alaçatı (North) to Gümüldür (South) in Seferihisar and Çeşme districts of İzmir Province. The tsunami also caused one casualty and several injured people. Learning from previous events, such as the October 30th, 2020 tsunami event, is a key issue in mitigation and future preparedness. Understanding the regional effects of this tsunami will definitely help in developing necessary tools for tsunami risk reduction in the Eastern Aegean region. In this regard, post-tsunami field surveys provide invaluable information to enable the enhancement of tsunami disaster risk management practices. Two different post-tsunami field surveys were performed after the October 30th, 2020 tsunami to document the tsunami effects along the affected coast in Turkey, considering the observed coastal amplitudes and inundation extent. The combined results of the field surveys include flow depth, runup, and inundation measurements, as well as arrival time information and coastal damage observations. Furthermore, we discuss the survey findings to better understand the tsunami behavior and its effects on the nearby coastal areas.

Another important point is that the public tsunami awareness in the Bodrum region in Turkey was extremely low, with no evacuation practices in July 2017 tsunami. There is a considerable increase in people's response to tsunami hazard in the Eastern Aegean region, as acquired from the eyewitness interviews during the October 30th tsunami field survey. However, considering the high seismicity, the public awareness about tsunamis that might take place around the Aegean coast and response to natural and official warnings should be raised and supported with evacuation practices.

In the light of lessons learned from the most recent Aegean tsunami, using the recent

measurement techniques and computational tools in tsunami hazard assessment has become extremely important to improve mitigation. In the framework of disaster risk reduction, high-resolution inundation maps through high-resolution vulnerability analysis and evacuation mapping are the essential requirements for the development of tsunami action plan for the coastal communities, which will help to achieve a successful tsunami risk reduction. In this work, additionally, the examples of new achievements in this direction from megacity İstanbul and high-resolution numerical modeling of tsunamis in the İzmir metropolitan are presented with discussions.