

EGU21-5006

<https://doi.org/10.5194/egusphere-egu21-5006>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



## The October 30, 2020 tsunami in the eastern Aegean Sea: Intensity mapping on Samos island based on the Integrated Tsunami Intensity Scale (ITIS 2012)

**Marilia Gogou**<sup>1</sup>, Ioanna Triantafyllou<sup>1</sup>, Spyridon Mavroulis<sup>1</sup>, Efthimis Lekkas<sup>1</sup>, and Gerassimos A. Papadopoulos<sup>2</sup>

<sup>1</sup>National & Kapodistrian University of Athens, Geology & Geoenvironmental, Greece (mgogou@geol.uoa.gr)

<sup>2</sup>International Society for the Prevention & Mitigation of Natural Hazards, 10681 Athens, Greece (gerassimospapadopoulos2@gmail.com)

On October 30, 2020, an Mw=7.0 earthquake occurred offshore northern Samos Island (Eastern Aegean, Greece). It was felt over a large area extending from Samos to Peloponnese in Greece and from Izmir to Istanbul in Turkey. It triggered many earthquake environmental effects and damage to buildings resulting in 119 fatalities in both countries. Among the triggered phenomena, tsunami waves with maximum height ~3.35 m struck mainly the northern coastal part of Samos Island and then other islands in the Aegean Sea including Chios, Andros, Ikaria Islands, and the western coast of Turkey.

In order to assess the tsunami intensity in Samos Island, the Integrated Tsunami Intensity Scale (ITIS 2012) was applied. ITIS 2012 is a recently introduced 12-grade scale ranging from I (not felt) to XII (completely devastating) and it is based on the assessment of a large number of objective criteria, grouped in six categories (physical quantities, impact on humans, impact on mobile objects, impacts on infrastructure, environmental effects and impact on structures).

In this context, the above information and data were used for the October 30, 2020 tsunami in Samos. Observations and measurements during a field survey conducted in Samos shortly after the event by the authors were mainly used for assigning intensities. Moreover, other sources included eyewitness, photos and videos from locals capturing the type and the extent of the tsunami impact as well as reports on the qualitative and quantitative tsunami properties and impact on the natural and built coastal environment were also used. Based on the recorded data and information and the guidelines for applying ITIS 2012, tsunami quantities and impact on humans, mobile objects, coastal infrastructure, the natural environment and buildings were taken into account. All available data were added and edited in a database in Geographic Information Systems (GIS) environment, specially designed for the purpose of the study. Then, the respective tsunami intensities were assigned in the studied sites. Moreover, interpolation methods have been also used in order to obtain zones of different intensity in the inundated coastal areas. The results included an ITIS 2012 intensity map of Samos Island.

Based on the assigned intensities, the October 30, 2020 tsunami is characterized as a moderate to strong event with considerable impact on all ITIS 2012 categories. The spatial distribution and the amount of the tsunami effects along the coastal area of Samos enabled the compilation of an intensity map with high resolution indicating that this scale works well for modern events with large amounts of effects and related information. Moreover, the individual criteria of the ITIS 2012 successfully complemented each other resulting in a detailed, concise and precise intensity map.

This is the first time that the ITIS 2012 is applied for a modern tsunami with large amounts of effects in the Mediterranean Region and especially the Aegean Sea. The results could be used for a more effective disaster risk management and risk mitigation strategies for tsunami in the Mediterranean Sea.