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Applying and validating the PTVA-3 Model at the Aeolian Islands, Italy: assessment of the vulnera of buildings to tsunamis

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Abstract. The volcanic archipelago of the Aeolian Islands (Sicily, Ita included on the UNESCO World Heritage list and is visited by more 200 000 tourists per year. Due to its geological characteristics, the related to volcanic and seismic activity is particularly high. Since 19 archipelago has been hit by eight local tsunamis. The most recent intense of these events happened on 30 December 2002. It was t by two successive landslides along the north-western side of the S volcano (Sciara del Fuoco), which poured approximately $2–3\times10^7$ r rocks and debris into the Tyrrhenian Sea. The waves impacted acr whole archipelago, but most of the damage to buildings and infras occurred on the islands of Stromboli (maximum run-up 11 m) and P

The aim of this study is to assess the vulnerability of buildings to d from tsunamis located within the same area inundated by the 200 The assessment is carried out by using the PTVA-3 Model (Papathc Tsunami Vulnerability Assessment, version 3). The PTVA-3 Model ca a Relative Vulnerability Index (RVI) for every building, based on a s selected physical and structural attributes. Run-up values within th inundated by the 2002 tsunami were measured and mapped by th Istituto Italiano di Geofisica e Vulcanologia (INGV) and the Universi Bologna during field surveys in January 2003. Results of the asses show that if the same tsunami were to occur today, 54 buildings w affected in Stromboli, and 5 in Panarea. The overall vulnerability le obtained in this analysis for Stromboli and Panarea are "average"/ and "very low", respectively. Nonetheless, 14 buildings in Strombo classified as having a "high" or "average" vulnerability. For some b we were able to validate the RVI scores calculated by the PTVA-3 M through a qualitative comparison with photographs taken by INGV University of Bologna during the post-tsunami survey. With the ex of a single structure, which is partially covered by a coastal dune c

seaward side, we found a good degree of accuracy between the P
Model forecast assessments and the actual degree of damage exp
by buildings. This validation of the model increases our confidence
predictive capability. Given the high tsunami risk for the archipelag
results provide a framework for prioritising investments in preventi
measures and addressing the most relevant vulnerability issues of
environment, particularly on the island of Stromboli.

Full Article (PDF, 4814 KB) Corrigendum

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