



## **Estimation of human damage and economic loss of buildings for the worst-credible scenario of tsunami inundation in the city of Augusta, Italy**

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The city of Augusta is located in the southern part of the eastern coast of Sicily. Italian tsunami catalogue and paleo-tsunami surveys indicate that at least 7 events of tsunami affected the bay of Augusta in the last 4,000 years, two of which are associated with earthquakes (1169 and 1693) that destroyed the city.

For these reasons Augusta has been chosen in the project ASTARTE as a test site for the study of issues related to tsunami hazard and risk. In last two years we studied hazard through the approach of the worst-case credible scenario and carried out vulnerability and damage analysis for buildings. In this work, we integrate that research, and estimate the damage to people and the economic loss of buildings due to structural damage.

As regards inundation, we assume both uniform inundation levels (bath-tub hypothesis) and inundation data resulting from the worst-case scenario elaborated for the area by Armigliato et al. (2015).

Human damage is calculated in three steps using the method introduced by Pagnoni et al. (2016) following the work by Terrier et al. (2012) and by Koshimura et al. (2009). First, we use census data to estimate the number of people present in each residential building affected by inundation; second, based on water column depth and building type, we evaluate the level of damage to people; third, we provide an estimate of fatalities.

The economic loss is computed for two types of buildings (residential and trade-industrial) by using data on inundation and data from the real estate market.

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