



Tsunami hazard assessment for the Azores archipelago: a historical review

Nuno Cabral, Teresa Ferreira, and Maria Gabriela Queiroz

Universidade dos Açores, Centro de Vulcanologia e Avaliação de Riscos Geológicos, Ponta Delgada, Portugal
(nuno.mr.cabral@azores.gov.pt, +351 296650142)

The Azores islands due to its complex geographical and geodynamic setting are exposed to tsunamigenic events associated to different triggering mechanisms, local or distant. Since the settlement of the Azores, in the fifteenth century, there are several documents that relate coastal areas flooding episodes with unusually high waves which caused death and destruction.

This work had as main objective the characterization of the different events that can be associated with tsunamigenic phenomena, registered in the archipelago. With this aim, it was collected diverse documentation like chronics, manuscripts, newspaper articles and magazines, scientific publications, and international databases available online.

From all the studied tsunami events it was identified the occurrence of some teletsunamis, among which the most relevant was triggered by the 1st November 1755 Lisbon earthquake, with an epicenter SW of Portugal, which killed 6 people in Terceira island. It is also noted the teletsunami generated by the 1761 earthquake, located in the same region as the latest, and the one generated in 1929 by an earthquake-triggered submarine landslide in the Grand Banks of Newfoundland. From the local events, originated in the Azores, the most significant were the tsunamis triggered by 1757 and 1980 earthquakes, both associated with the Terceira Rift dynamics. In the first case the waves may also be due to earthquake-triggered. With respect to tsunamis triggered by sea cliffs landslides it is important to mention the 1847 Quebrada Nova and the 1980 Rocha Alta events, both located in the Flores Island. The 1847 event is the deadliest tsunami recorded in Azores since 10 people died in Flores and Corvo islands in result of the propagated wave.

The developed studies improve knowledge of the tsunami sources that affected the Azores during its history, also revealing the importance of awareness about this natural phenomenon. The obtained results showed that the tsunami hazard in the Azores is mostly driven from the events triggered by distant earthquakes and local earthquakes and landslides. In this context, were identified 12 tsunami events. In another context, it were identified 6 events associated with coastal areas flooding due to floods and/or extreme weather phenomena, hypothetically identified as meteotsunamis. It should be stressed that, despite the differences associated with their triggering mechanisms, both the tsunamis generated by geological factors and those related to atmospheric phenomena may have similar impact. Although the absence of reports identifying tsunamis associated with volcanic activity, the eruptive history of the Azores active volcanoes shows high magnitude eruptions with considerable tsunamigenic potential.