



State-of-the-Art in Tsunami Risk Modelling for a global perspective

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Tsunamis can be considered as the natural hazard with the largest global spread in terms of hazard distribution due to a single event with the exception of global extinction level events (volcanoes, meteor impacts). Multiple extreme events have occurred during the last decade, including the devastating 2004 Sumatra tsunami and the events in Japan and Chile in 2011. In general, the hazard and risk of tsunamis is investigated in regional or inter-regional projects like in Japan, Indonesia or New Zealand following different methodologies and investigating various source mechanisms.

Thus, in this study, a review of the state-of-the-art in global tsunami risk modelling has been undertaken. The most recent and up-to-date methodologies and projects from all over the world have been assembled for a direct comparison to provide a global perspective into a hazard scenario that affects multiple countries at once to extreme magnitudes. The assemblage of these models provides an insight into the temporal and spatial development of tsunami risk research and how it was adopted by research institutes and combined into official hazard modelling. A global map is assembled, indicating local and international case studies and projects with respect to their source model and date of development. In addition, the study also covers the development of software packages used to set up hazard and risk models and it investigates the different source processes of tsunami generation and propagation. A comparison is made using a multicriteria approach to examine the physical models and capabilities of software packages as well as the source identification procedure in different hazard models. A complete and up-to-date overview of tsunami risk and hazard modelling is presented, compared and classified which has far-reaching uses for the preparation of a tsunami risk assessment at any point on the earth.