



## Real Time Seismic Loss Estimation in Italy

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By more than 15 years the Seismic Risk Office is able to perform a real-time evaluation of the earthquake potential loss in any part of Italy. Once the epicentre and the magnitude of the earthquake are made available by the National Institute for Geophysics and Volcanology, the model, based on the Italian Geographic Information Systems, is able to evaluate the extent of the damaged area and the consequences on the built environment.

In recent years the model has been significantly improved with new methodologies able to conditioning the uncertainties using observations coming from the fields during the first days after the event.

However it is reputed that the main challenges in loss analysis are related to the input data, more than to methodologies. Unlike the urban scenario, where the missing data can be collected with enough accuracy, the country-wise analysis requires the use of existing data bases, often collected for other purposes than seismic scenario evaluation, and hence in some way lacking of completeness and homogeneity. Soil properties, building inventory and population distribution are the main input data that are to be known in any site of the whole Italian territory. To this end the National Census on Population and Dwellings has provided information on the residential building types and the population that lives in that building types. The critical buildings, such as Hospital, Fire Brigade Stations, Schools, are not included in the inventory, since the national plan for seismic risk assessment of critical buildings is still under way. The choice of a proper soil motion parameter, its attenuation with distance and the building type fragility are important ingredients of the model as well.

The presentation will focus on the above mentioned issues, highlighting the different data sets used and their accuracy, and comparing the model, input data and results when geographical areas with different extent are considered: from the urban scenarios, to the country-wise analysis up to the recent Italian contribution in the world wide vulnerability assessment within the USGS Pager project.