



## **Global Dynamic Exposure and the OpenBuildingMap - Communicating Risk and Involving Communities**

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The substantial reduction of disaster risk and live losses, a major goal of the Sendai Framework by the United Nations Office for Disaster Risk Reduction (UNISDR) requires a clear understanding of the dynamics of the built environment and how it affects, in case of natural disasters, the life of communities, represented by local governments and individuals. These dynamics are best understood and captured by local communities, following two of the guiding principles UNISDR formulated: "empowerment of local authorities and communities" and "engagement from all of society". Moreover, communities that participate in risk assessments increase their understanding of efficient risk mitigation measures. Our Global Dynamic Exposure model and its technical infrastructure build on the involvement of communities in a citizen-science approach. Simultaneously, it helps educating community members in the risks they are facing and how they can prevent losses of lives.

We are employing a crowd-sourced exposure capturing using OpenStreetMap (OSM), an ideal foundation with already more than 250 million building footprints (growing by  $\sim 100'000$  per day), and a plethora of information about school, hospital, and other critical facilities. With our OpenBuildingMap system, we are harvesting this dataset by processing every building in near-realtime. We are collecting exposure and vulnerability indicators from explicitly provided data (e.g. hospital locations), implicitly provided data (e.g. building shapes and positions), and semantically derived data, i.e. interpretation applying expert knowledge. The expert knowledge is needed to translate the simple building properties as captured by OpenStreetMap users into vulnerability and exposure indicators and subsequently into building classifications as defined in the Building Taxonomy 2.0 developed by the Global Earthquake Model (GEM) and the European Macroseismic Scale (EMS98). With this approach, we increase the resolution of existing exposure models from aggregated exposure information to building-by-building vulnerability. Additionally, we include available open datasets to further improve our indicator assessment.

With our tools, interested communities can capture their exposure and analyze how natural disaster will affect them. It helps communicating risks down to the community level and provides the means to involve communities to mitigate risks.