

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. We are employing a crowd-sourced exposure capturing based on OpenStreetMap (OSM), an ideal foundation with already more than 375 million building footprints (growing daily by ~150,000), and a plethora of information about school, hospital, and other critical facilities. We are harvesting this dataset with our OpenBuildingMap system by processing the information associated with every building in near-real-time. We are enriching this dataset in a truly big-data approach by including built-up area detection from remote sensing with satellite and radar imagery combined with different sources of road networks, as well as various open datasets and aggregated exposure models that provide relevant additional information on buildings and land use. 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.

We expect the quality of near-real-time estimates of the extent of natural disasters to increase by an order of magnitude, based on the data we are collecting. We envision authorities and first responders greatly benefitting from maps pinpointing the greatest trouble spots in disasters and from detailed quantitative estimates of the likely damage and human losses. With our tools, interested communities can capture their exposure and analyze how natural disaster may affect them. It helps communicating risks down to the community level and helps educating community members in the risks they are facing, how they can mitigate risks, and how they can prevent losses of lives.

Keywords: Exposure, Risk, Communication, Earthquakes, Loss, Big data