OASIS LOSS MODELLING FRAMEWORK

GEM GLOBAL EARTHQUAKE MODEL working together to assess risk

THE GEM FOUNDATION

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GEM is a non-profit foundation and UN accredited Non-Governmental Organization (NGO). It was launched by the Global Science Forum of the Organization for Economic Co-operation and Development (OECD) and started operations in 2009 with the establishment of its headquarters in Pavia, Italy.

In a collaborative effort involving scientists and stakeholders around the world, GEM is working to advance the science and technology needed for state-of-the-art data collection and analysis, seismic hazard and risk modeling, and risk assessment at global, regional, national, and local levels.

Since its foundation in 2009, GEM has supported a number of global projects worth more than 10 million EUR. These projects resulted in databases of historical earthquakes, active faults, population and building exposure, as well as guidelines for the development of vulnerability models and a classification system to categorize buildings worldwide.

These efforts have involved more than 200 international experts and the resulting products are currently being used extensively by the disaster risk reduction community, academic institutions, engineering companies and the insurance sector. During these years, GEM has also developed an open-source software for the assessment of earthquake hazard and risk, named the OpenQuake-engine.

GEM is an unprecedented global effort, structured as a formal partnership between national governments (such as Australia, New Zealand, Japan, Italy, Nepal, Switzerland, and Norway), private organizations (such as AIR Worldwide, Munich Re, and Zurich Insurance Group), scientific institutions (such as USGS, EERI), together with informal associations with international organizations involved in disaster risk management (such as the World Bank-GFDRR, the UNISDR and UNESCO), and experts, NGOs and other risk initiatives.

GEM's long-term goal is to become the most complete and reliable source for earthquake hazard and risk information. To this end, GEM works in four areas:

1- Development and maintenance of high-quality risk assessment tools

2- Collection and generation of earthquake risk data and information

3- Development and implementation of risk assessment applications

4- Capacity building and technology transfer

The GEM Foundation has extensive experience in the development of tools for probabilistic seismic hazard and risk analysis, collection and processing of earthquake damage data, and generation of risk information for disaster risk managers. All the tools and models created by GEM are open source and open access.

OASIS LMF AND GEM

Oasis Loss Modelling Framework and GEM have been working closely for many years. OASIS and GEM approaches and offerings are complementary, which opens interesting possibilities such as open & transparent software and model development with support for multi-peril loss estimation and financial module. Since GEM is currently producing a global mosaic of risk models, it is now possible to contemplate making Oasis-compatible earthquake models for all countries/regions.

During the OASIS event held in Zurich on July 3rd Paul Henshaw, GEM Director of Technology and Development, presented initial findings and considerations in porting a proof-of-concept OpenQuake risk model to Oasis. Together with Malcolm Haylock, Sunstone Risk Solutions, GEM has successfully ported its

event-based-risk model for the Dominican Republic into Oasis LMF, and obtained similar results to those generated with OpenQuake.

The goal of porting an OpenQuake Risk model to Oasis LMF was to produce an Oasis LMF compatible model for which the AALs (annual average losses) are similar (~1%) to those produced by the original OpenQuake model. With this proof-of-concept now completed for the Dominican Republic, GEM is now seeking the interest of OASIS members in gaining access to this and other GEM models, which would be useful for prioritizing the models to be made available.

GEM is interested in continuing the collaboration with Oasis, and is also exploring complementary approaches with Sunstone and AIR. GEM and Oasis will continue to investigate possible sustainability models and funding sources to support continued and enhanced collaboration.

John Schneider, Secretary General at GEM, presented an update on the development of GEM's global earthquake hazard and risk model and other applications during this year's edition of the Oasis Conference: The Good, The Bad and The Ugly. His presentation highlighted an overview of the Global Earthquake Model which will be completed in December.

THE GLOBAL RISK MAP

One of the products of the Global Earthquake Model is a Global Seismic Hazard Map, which is intended to be an upgrade of GSHAP. GEM is set to release version 1.0 of this map on December 5th of this year. In the global mosaic of hazard models, some of the models have already been released; others are awaiting publication of articles or review and will be released over time.

As with the hazard component, the Global Risk Maps will be based on a mosaic of risk models – the maps will be available for average annual economic losses as well as fatalities.

The GEM event on December 5th will gather experts and stakeholders from all over the world, including representatives from Oasis. The event is also a great opportunity for GEM to share its work and to establish new collaborations with potential partners coming from insurance and reinsurance companies, universities, scientific agencies and institutions.

Although physical attendance to the event is by invitation only, you are invited to attend the event via live-streaming. Please, check this page regularly for updates on the event: https://www.globalquakemodel.org/gem.