



GEM1: First-year modeling and IT activities for the Global Earthquake Model

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GEM is a public-private partnership initiated by the Organisation for Economic Cooperation and Development (OECD) to build an independent standard for modeling and communicating earthquake risk worldwide. GEM is aimed at providing authoritative, open information about seismic risk and decision tools to support mitigation. GEM will also raise risk awareness and help post-disaster economic development, with the ultimate goal of reducing the toll of future earthquakes. GEM will provide a unified set of seismic hazard, risk, and loss modeling tools based on a common global IT infrastructure and consensus standards. These tools, systems, and standards will be developed in partnership with organizations around the world, with coordination by the GEM Secretariat and its Secretary General. GEM partners will develop a variety of global components, including a unified earthquake catalog, fault database, and ground motion prediction equations. To ensure broad representation and community acceptance, GEM will include local knowledge in all modeling activities, incorporate existing detailed models where possible, and independently test all resulting tools and

models. When completed in five years, GEM will have a versatile, openly accessible modeling environment that can be updated as necessary, and will provide the global standard for seismic hazard, risk, and loss models to government ministers, scientists and engineers, financial institutions, and the public worldwide. GEM is now underway with key support provided by private sponsors (Munich Reinsurance Company, Zurich Financial Services, AIR Worldwide Corporation, and Willis

Group Holdings); countries including Belgium, Germany, Italy, Singapore, Switzerland, and Turkey; and groups such as the European Commission. The GEM Secretariat has been selected by the OECD and will be hosted at the Eucentre at the University of Pavia in Italy; the Secretariat is now formalizing the creation of the GEM Foundation. Some of GEM's global components are in the planning stages, such as the developments of a unified active fault database and earthquake catalog. The flagship activity of GEM's first year is GEM1, a focused pilot project to develop GEM's first hazard and risk modeling products and initial IT infrastructure, starting in January 2009 and ending in March 2010. GEM1 will provide core capabilities for the present and

key knowledge for future development of the full GEM computing Environment and product set. We will build GEM1 largely using existing tools and datasets, connected through a unified IT infrastructure, in order to bring GEM's initial capabilities online as rapidly as possible. The Swiss Seismological Service at ETH-Zurich is leading the GEM1 effort in cooperation with partners around the world. We anticipate that GEM1's products will include:

- A global compilation of regional seismic source zone models in one or more common representations
- Global synthetic earthquake catalogs for use in hazard calculations
- Initial set of regional and global catalogues for validation
- Global hazard models in map and database forms
- First compilation of global vulnerabilities and fragilities
- Tools for exposure and loss assessment
- Validation of results and software for existing risk assessment tools to be used in future GEM stages
- Demonstration risk scenarios for target cities
- First version of GEM IT infrastructure

All these products will be made freely available to the greatest extent possible. For more information on GEM and GEM1, please visit <http://www.globalquakemodel.org>.