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Building Global Databases for Seismic Risk Assessment

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ABSTRACT

The Global Earthquake Model (GEM) initiative aims to develop a global model of earthquake risk as an open source, community-driven project. In order to begin this in a structured way, a number of Global Components that cover the scientific modules of the model have been defined, and Requests for Proposals have been released, requesting international consortia to bid to lead these projects. Within the risk domain, 5 Global Components have been identified, with the following objectives:

- GEM Ontology and Taxonomy: to define the framework for calculating seismic risk and classify the components therein.
- Global Earthquake Consequences Database: to collect post-earthquake data such as loss of life, injuries, damage and economic loss into a common web-based repository.
- Global Exposure Database: to construct a global building and population inventory.
- Global Vulnerability Estimation Methods: to define levels of damage and loss as a function of ground motion intensity, for a global taxonomy of buildings.
- Inventory Data Capture Tools: to support the population of the exposure and consequences databases through innovative open-source tools.

The consortia leading these global components will be required to define standards and best practice related to the methodologies used in seismic risk assessment and in particular the collection and storage of data needed therein. Some of the details of these global components will be presented, including the strategy behind the development of a global exposure database and the methodologies to be employed in defining vulnerability functions for a global taxonomy of buildings. The use of social media such as weblogs and internet forums and community-driven approaches, such as crowdsourcing, within the activities of the global components will also be discussed.