

GEM Request for Proposal: Global Active Fault & Seismic Source Database

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Expected Decision: 15 September 2009
Target budget: 450,000€
Target duration of project: 24 months

Earthquakes rupture faults, and large quakes rupture large faults. Seismic hazard assessments should therefore incorporate an inventory of active faults. Despite this, many seismic hazard assessments do not consider faults at all, or do so only sparingly because the requisite fault data are absent or inadequate. GEM seeks to overcome this obstacle by building a uniform global active fault and seismic source database with a common set of strategies, standards and formats, to be placed in the public domain. This effort will build upon the 1989-2004 International Lithosphere Program's Major Active Faults of the World. Some faults cut the earth's surface and others do not, so there must be both observational elements (active faults and folds that have slipped in the past 10-100 kyr) and interpretative elements (inferred seismic sources) to the database. In addition to collect the best fault information presently available, GEM aims at establishing appropriate mechanisms to capture new fault data as it becomes available, to capture the rapid expansion of fault knowledge and the ongoing debate about fault geometry, kinematics, and interaction.

Specific tasks and deliverables expected for this project include:

T1. Establish a common set of definitions, strategies, standards, quality criteria and formats for the compilation of the global database of active faults and seismic sources.

T2. Compile a global database by importing into the GEM database existing national and regional active fault and seismic source databases, as well as existing databases of subduction zone megathrusts, plate boundary rifts, and oceanic transforms. Wherever possible the slip rate and its upper and lower bounds should be included and citations given.

T3. Compile a global dataset of fault-based seismic sources with associated geometry and slip rates. The seismic sources can include 'area sources' where faults are unclear, unknown, or distributed. Capture observational uncertainties and provide alternative versions with logic tree weights to account for conflicting data or interpretations.

T4. Develop the database system and associated web portal to enable scientists to easily contribute new fault data and seismic source data, and keep the database updated. Propose criteria and procedures to ensure quality control in building the database.

T5. For regions that are not covered by the database, establish small groups to scour the literature, scan and digitize active faults from publications and reports, and input these into the database. In areas with few mapped faults and little useful literature, consider engaging experienced groups and local geologists to conduct reconnaissance fault mapping, largely through satellite imagery.