



Uniform and open standards to calculate and communicate earthquake risk worldwide

GEM's mission is to engage a global community in the design, development and deployment of state-of-the-art models and tools for earthquake risk assessment worldwide.

What GEM envisions and has started to work on, is the bringing together of state-of-the-art science and national, regional, international organisations as well as individuals, in a global collaborative effort that will have a lasting impact on seismic risk assessment. By functioning as a true community effort, involving hundreds of organisations and individuals, GEM aims to produce a state-of-the-art, dynamic and openly accessible model for the assessment of seismic risk worldwide, featuring not only the computation of the probability of earthquakes occurring and inducing damage to buildings and houses, but also methods and tools for analysing impacts of earthquakes on economy and society. The model and its tools are to meet the needs of a wide group of prospective users and beneficiaries and will need to include features that support the work of all those entities and individuals working and deciding on risk resilience and mitigation. The model will through its interface allow for earthquake risk assessment at the community, national and international level and integration with many ongoing initiatives on disaster risk reduction. By 2013, GEM stakeholders from around the globe will be able to access the OpenGEM web-platform to analyse seismic risk, including the consequences of earthquakes on society and economy, measured over space and time.

The GEM effort is unique in scope, scale and community involvement; its main features are summarized here:

Global coverage

The model will feature global and regional coverage, and include where possible currently less covered/monitored areas. Technology-transfer will be an integral part of GEM, to support use of the model around the globe.

State-of-the-art

Leading experts in all relevant disciplines are working on development of an innovative model, incorporating the latest developments in science and technology, and develop standards that are applicable and accepted around the world.

Community-based

The model will be consensual, accepted and actually used, because a wide community involved in designing and developing GEM's software and tools, and in collecting the main data of this model which is therefore owned by the public and trusted.

Open access

Risk information must be broadly available in order to cater for the adoption of risk-mitigation behaviour. GEM will deliver open-source software, transparent tools and global datasets that are accessible to different users around the world.

Public/private partnership

GEM combines the strengths and objectives of both the public and the private sectors and ensures hereby that its output will serve a variety of stakeholder groups.

Serving users

To ensure that the model will serve the needs of all possible users, from the general public to decision makers, risk will be communicated in an effective manner through intuitive interfaces. User needs assessment exercises and case studies are carried out to ensure that GEM can be effectively used to support risk mitigation.

A comprehensive tool

The global earthquake model will not only cover earthquake hazard and earthquake risk (exposure and vulnerability), but also allow for assessment of impacts of seismic events on society and economy, on different timescales: short term (relief), medium term (reconstruction and recovery) and long term (risk reduction and mitigation).

Dynamic

GEM is producing an updatable, modular and flexible model that users can plug their own data into, that is able to communicate risk through various types of outputs (customisable maps, graphs, tables) and allows for sharing of data, output and opinions.

Application beyond GEM

GEM's software is built in such a way that it is expandable to other perils. Moreover, through modular construction, GEM will collaborate with other initiatives, organisations and individuals on software modules that have an application that goes beyond GEM or even risk assessment alone.

Private Founders



Munich Re Group



AIR Worldwide Corporation



Eucentre Foundation



ZURICH®

Zurich Financial Services Group



Willis

Private Participants



FM Global



Hannover Re Group

Public Participants



Italy



Switzerland



Germany



Australia



Turkey



Singapore



Norway



United Kingdom



New Zealand



Belgium

Associate Participants



Organisation for Economic Development and Cooperation (OECD)



United Nations Educational, Scientific and Cultural Organisation (UNESCO)



International Association of Earthquake Engineering (IAEE)



The World Bank



United Nations International Strategy on Disaster Reduction (UN/ISDR)



International Association of Seismology and Physics of the Earth's Interior (IASPEI)

Partners GEM Foundation

Collaborators (global)

Alliance for Global Open Risk Analysis (AGORA) - France
 BRGM - France
 British Geological Survey (BGS) - United Kingdom
 California Department of Transportation - United States
 Cambridge Architectural Research Ltd (CAR) - United Kingdom
 Centre for Disaster Management and Risk Reduction Technology (CEDIM) - Germany
 Centre for International Earth Science Information Network (CIESIN) - United States
 Centre for Research on the Epidemiology of Disasters (CRED) - Belgium
 China Earthquake Administration (CEA) - China
 Council for Geoscience South Africa - South Africa
 Earthquake Engineering Research Institute (EERI) - United States
 ETH Zurich - United Kingdom
 Earth Observatory Singapore (EOS) - Singapore
 EQECAT - United States
 Evaluación de Riesgos Naturales (ERN) - Mexico
 Ferdowsi University - Iran
 GeoForschungsZentrum Potsdam (GFZ) - Germany
 GeoHazards International (GHI)
 Geoscience Australia - Australia
 GNS Science - New Zealand
 German Aerospace Center (DLR) - Germany
 ImageCat Inc. - United States
 Institut de Ciències de la Terra JAUME ALMERA - Spain
 International Institute for Applied Systems Analysis (IIASA) - Austria
 Istituto Nazionale di Geofisica e Vulcanologia (INGV) - Italy
 International Seismological Centre (ISC) - United Kingdom
 Joint Research Centre (European Commission)
 Kandilli Observatory and Earthquake Research Institute (KOERI) - Turkey
 Kyoto University - Japan
 Middle East Technical University (METU) - Turkey
 National Laboratory for Civil Engineering (LNEC) - Portugal
 NOR SAR - Norway
 OpenGeo - United States
 Pacific Earthquake Engineering Research Center (PEER) - United States
 Pacific Gas & Electronic Company (PG&E) - United States
 Risk Management Solutions (RMS) - United States
 Russian Academy of Sciences (RAS) - Russia
 SinoTech - Taiwan
 Southern California Earthquake Center (SCEC) - United States
 Stanford University - United States
 Tokyo Institute of Technology - Japan
 UN-HABITAT (Global Urban Observatory)
 United States Geological Survey (USGS) - United States
 Universidad de Chile - Chile
 Universidad Nacional de San Luis (UNSL) - Argentina
 Université Joseph Fourier - France
 University of Bath - United Kingdom
 University of California - United States
 University of Colorado (at Boulder) - United States
 University of Kyoto / Disaster Prevention Research Institute (DPRI) - Japan
 University of Ljubljana - Slovenia
 University College London (UCL) - United Kingdom
 University of Pavia - Italy
 WAPMERR - Switzerland

Collaborators (regional)

AFRICA
 Centre for Geodesy and Geodynamics - Nigeria
 Council for Geoscience - South Africa
 Goetz Observatory - Zimbabwe
 Eastern & Southern Africa Regional Seismological Working Group
 Geological Survey Zambia - Zambia
 ICSU; Regional Office for Africa
 International Science Programme
 North African Group for Earthquake and Tsunami studies (NAGET)
 Kenya Meteorological Department - Kenya
 Ministry of Environment and Natural Resources - Kenya
 National University of Science & Technology - Zimbabwe
 University of Addis Ababa - Ethiopia
 University of Dar es Salaam - Tanzania
 University of Nairobi - Kenya
 University of Pretoria - South Africa
 University of Witwatersrand - South Africa
 USTHB/FGC/Built Environment Res. Lab. (LBE) - Algeria

AMERICA
 Alfred E Alquist Seismic Safety Commission - United States
 CAPRA - Central America
 Consejo Nacional de Ciencia y Tecnología (CONCYTEC) - Peru
 Escuela Politécnica Nacional (EPN) - Ecuador
 Fundación Venezolana de Investigaciones Sismológicas (FUNVISIS) - Venezuela
 Instituto Nacional de PREvención Sísmica (INPRES) - Argentina
 Mid-America Earthquake Center - United States
 Observatorio San Calixto - Bolivia
 Observatorio Nacional - Brazil
 Universidad de Chile - Chile
 Universidad Nacional de Asunción - Paraguay
 Universidad Nacional de Colombia - Colombia
 University of the West Indies Seismic Research Centre - Trinidad & Tobago
 United States Geological Survey (USGS) - United States

ASIA/PACIFIC
 Aga Khan Development Network; SMRI - Tajikistan
 AIR Worldwide; India - India
 Amateur Seismic Centre - India
 Asian Institute of Technology (AIT) - Thailand
 Australia-Indonesia Facility for Disaster Risk Reduction (AIFDR) - Australia
 Building Materials & Technology Promotion Council (BMTPC) - India
 Chulalongkorn University (CHULA) - Thailand
 China Earthquake Administration (CEA) - China
 Centre for Economic and Social Studies (CESS) - India
 Centre for Mathematical Modelling & Computer Simulation (CMCCS) - India
 Central Water and Power Research Station - India
 Earthquake Risk Evaluation Centre (EREC) - India
 Engineers India Limited (EIL) - India
 Gadjah Mada University (GMU) - Indonesia
 Geological Survey of India (GSI) - India
 Geoscience Australia - Australia
 GNS Science - New Zealand
 IIT Bombay - India
 IIT Kanpur - India
 IIT Kharagpur - India
 IIT Madras - India
 IIT Roorkee - India
 India Meteorological Department (IMD) - India
 Indian Institute of Science (IISc) - India

Institute of Seismological Research (ISR) - India
 Institut Teknologi Bandung (ITB) - Indonesia
 Lembaga Ilmu Pengetahuan Indonesia (LIPI) - Indonesia
 Myanmar Engineering Society (MES) - Myanmar
 Nanyang Technological University - Singapore
 National Geophysical Research Institute - India
 National Institute of Advanced Industrial Science and Technology (AIST) - Japan
 National Institute of Oceanography (NIO) - India
 National Research Institute for Earth Science and Disaster Prevention (NIED) - Japan
 National Research Institute of Fire and Disaster (NRI) - Japan
 National Institute of Information and Communication Technology - Japan
 Philippine Institute of Volcanology & Seismology (PHIVOLCS) - Philippines
 Research Center for Urban Safety and Security, Kobe University - Japan
 RMSI - India
 Survey of India - India
 TARU - India
 Vietnam Institute for Building Sciences & Technology (IBST) - Vietnam
 Wadia Institute of Himalayan Geology - India

EUROPE
 Analysis and Monitoring of Environmental Risks (AMSA) - Italy
 Aristotle University of Thessaloniki (AUTH) - Greece
 British Geological Survey (BGS) - United Kingdom
 Bureau de Recherches Géologiques et Minières (BRGM) - France
 Cambridge Architectural Research Ltd - United Kingdom
 Centre de Recherche en Astronomie, Astrophysique et Géophysique - Algeria
 Eucentre - Italy
 GeoForschungsZentrum Potsdam - Germany
 Istituto Nazionale di Geofisica e Vulcanologia (INGV) - Italy
 Instituto Superior Técnico (IST) - Portugal
 Joint Research Centre (JRC)
 Kandilli Observatory and Earthquake Research Institute (KOERI) - Turkey
 Karlsruhe Institute of Technology (KIT) - Germany
 Université Joseph Fourier - France
 Laboratório Nacional de Engenharia Civil (LNEC) - Portugal
 Middle East Technical University (METU) - Turkey
 Montenegro Seismological Observatory - Montenegro
 National Institute for Earth Physics (NIEP) - Romania
 Natural Environment Research Council (NERC) - United Kingdom
 NOR SAR - Norway
 Norwegian Geotechnical Institute (NGI) - Norway
 Österreichisches Forschungs- und Prüfzentrum Arsenal Ges m.b.h. - Austria
 Royal Observatory of Belgium - Belgium
 Seismological Laboratory, University of Athens - Greece
 University of Patras - Greece
 University of Pavia - Italy
 University of Roma 'La Sapienza' - Italy
 Vienna Consulting Engineers (VCE) - Austria
 Willis Group Holdings - United Kingdom

MIDDLE EAST
 American University of Beirut - Lebanon
 Atomic Energy Commission of Syria (AECS) - Syria
 Azerbaijan Academy of Sciences (ANAS) - Azerbaijan
 University of Technology (CUT) - Cyprus
 Institute of Geophysics - Georgia
 International Institute of Earthquake Engineering & Seismology (IIEES) - Iran
 Kandilli Observatory and Earthquake Research Institute (KOERI) - Turkey
 Middle East Technical University (METU) - Turkey
 National Academy of Sciences of Armenia - Armenia
 NDMA Pakistan - Pakistan
 Pakistan Institute of Development Economics (PIDE) - Pakistan
 Sakarya University - Turkey
 Yarmouk University - Pakistan