INTRODUCTION TO GEM2018

• Iain Stewart - Master of Ceremonies
  – Prof of Geoscience Communication, University of Plymouth, UK

• Mauro Dolce - Chair of GEM Governing Board
  – Director General, Department of Civil Protection
  – Prof of structural engineering, University of Naples

• John Schneider - GEM Secretary General
History of GEM

• **Establishment** – in Pavia in 2009 as a non-profit, public-private partnership

• **Mission** – a world more resilient to earthquakes

• **Founders**
  – Domenico Giardini, Anselm Smolka, Ross Stein, Jochen Zschau
GEM Core Principles

**Core Principles**
- Openness
- Collaboration
- Credibility
- Public Good

**Development**
- Develop data, tools and models
- Build capacity and knowledge

**Application**
- Risk assessment and technical support
- Risk communication and dissemination
History of GEM

• **WP1 2009 to 2013**
  – Regional hazard, global datasets and collaboration
  – Analysis methodology and tools

• **WP2 2014 to 2018**
  – Release of OpenQuake platform (Jan 2015)
  – Alignment with Sendai Framework (March 2015)
  – Completion of Global Earthquake Model (from June 2015)
    • mosaic of models developed at national to regional levels
UNISDR Award

GEM receives Damir Čermerin Award
European Forum for Disaster Risk Reduction
Rome, Italy (22 November 2018)
GEM Leadership

WP 1 2009-2013

• Governing Board
  – Anselm Smolka (Chair), Jochen Zschau (Vice Chair)

• Secretariat
  – Rui Pinho (Secretary General), Helen Crowley (Vice Sec Gen)

• Science Board
  – Ross Stein (Chair), Paolo Bazzurro (Vice Chair), Mustafa Erdik, Louise Comfort, Philip Maechling, Kazuki Koketsu, Andrew King, Omar Cardona, Stuart Gil, Amod Dixit, Fabrice Cotton, Pennung Warnitchai, Mary Lou Zoback, Ken Hao, Alberto Monti, Firoz Verjee, Hugo Yepes
GEM Leadership

WP 2 2014-2018

• Governing Board
  – John Schneider (Chair to 2015), Mauro Dolce (Chair), Claudio Boettcher (Vice Chair)

• Secretary General
  – Anselm Smolka (to 2016), John Schneider

• Science Board
  – Fabrice Cotton (Chair), Ken Hao (Vice Chair), Hugo Yepes, Pennung Warnitchai, Reginald DesRoches, Laurie Johnson, Emily So

• Sustainability Committee
  – GB Chair and Vice Chairs + John Rees, Kelvin Berryman, Anselm Smolka, Lou Gritzo (to 2017), Jörg Steffensen
Building the Models and Maps

• Purpose
  – Common understanding
  – Shared ownership
  – Motivating risk reduction

• Risk assessment framework
  – Collaborative
  – Common methodology and tools
  – Open and transparent
  – Maintainable

• Maps and models
  – Mosaic
  – Snapshot in time
  – Yours to add to or modify
Global Earthquake Model
Products Released Dec. 5\textsuperscript{th} 2018

Posters for hazard and risk (physical and PDF download)

Interactive map tool:
- Global hazard map with PGA value for selected cell
- Global exposure with number & value of buildings per country
- Global risk map with average annual economic losses per country, link to risk profile.

V1.0 Country Profiles for around 120 countries (PDF download)

Updated Active Fault Database (on github)
Updated vulnerability Database (300 functions)
Proposed Product Release Plan

In 2019

• For: Africa, Continental South-East Asia, Middle East, Central America and the Caribbean, Central Asia, Indonesia/Philippines, South Asia, China and territories, Australia, New Zealand, Canada, US, Pacific Islands, Japan, North-Asia, Mexico:
  – Full Hazard models in OpenQuake engine
  – Improved Admin 1 level exposure
  – Improved Vulnerability functions
  – Updated Country Profiles

• Improved interactive map tool: Building taxonomy distribution, occupancy distribution in exposure & risk maps, hazard curves, UHS.

In 2020

• Published, peer-reviewed paper for each hazard model. For risk models, papers will be present in special issue of Earthquake Spectra.
AGENDA

5TH OF DECEMBER 2018
0900 - 1800
CAR COLLEGE
PAVIA, ITALY
## Morning program

<table>
<thead>
<tr>
<th>time</th>
<th>topics</th>
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</thead>
<tbody>
<tr>
<td>09:00 - 09:20</td>
<td>Introduction</td>
</tr>
<tr>
<td>09:20 - 11:00</td>
<td>How we built the maps and models</td>
</tr>
<tr>
<td></td>
<td>• Global Earthquake Hazard overview</td>
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<td></td>
<td>• Global Earthquake Risk overview</td>
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<tr>
<td>11:00 - 11:30</td>
<td>Coffee Break</td>
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<tr>
<td>11:30 - 12:15</td>
<td>Featured Speakers: Urban risk and resilience</td>
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<td>• Developing an urban earthquake risk assessment capability and applications to cities in Colombia</td>
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<td>• Developing a National Earthquake Resilience Strategy for Canada</td>
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<tr>
<td>12:15 - 13:00</td>
<td>Panel 1: Uses for the maps and models, technical perspective</td>
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## Afternoon program

<table>
<thead>
<tr>
<th>time</th>
<th>topics</th>
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<tbody>
<tr>
<td>13:00 - 14:00</td>
<td>Lunch</td>
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<tr>
<td>14:00 - 14:45</td>
<td>Featured Speakers: Disaster impact and closing the protection gap</td>
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<td>• Impacts and lessons from the recent Indonesian earthquakes in Lombok and Palu, Indonesia</td>
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<td></td>
<td>• Closing the protection gap for developing countries</td>
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<tr>
<td>14:45 - 15:30</td>
<td>Panel 2: Drivers and demands for the maps and models, strategic perspective</td>
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<tr>
<td>15:30 - 17:00</td>
<td>Exploring the Maps, Demos &amp; Posters + coffee break</td>
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<tr>
<td>17:00 - 17:45</td>
<td>Panel 3: Future Directions for models</td>
</tr>
<tr>
<td>17:45 - 18:00</td>
<td>Wrap-up and Call to Action</td>
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</tbody>
</table>
Featured Speakers

• Urban risk and resilience
  – Ana Beatriz Acevedo - Developing an urban earthquake risk assessment capability and applications to cities in Colombia
  – Murray Journeay - Developing a National Earthquake Resilience Strategy for Canada
Panel 1: Uses for the maps and models, technical perspective

• **Moderator:** Claudio Boettcher - Zurich Insurance
• **Panelists**
  – Amaryllis Mouyiannou (Axis Capital)
  – Surya Shrestha (Nepal Society Earthquake Technology - NSET)
  – Aneta Florczyk (Joint Research Centre JRC - EU)
  – Daniela Di Bucci (Department of Civil Protection, Italy)
  – Rolando Castillo (University of Costa Rica)
Panel 1: Uses for the maps and models, technical perspective

Questions

• What is your view about the use of GEM’s maps and models so far?

• Can you provide a short overview on actual use cases from the perspective of your organization?

• How can GEM products be developed further to address needs for specific applications from a technical perspective?
Featured Speakers

• Disaster impact and closing the protection gap
  – Mokhamad Asrurifac - Impacts and lessons from the recent Indonesian earthquakes in Lombok and Palu, Indonesia
  – Hector Ibarra - Closing the protection gap for developing countries
Panel 2: Drivers and demands for the maps and models, strategic perspective

• Moderator: Anselm Smolka (GEM)

• Panelists
  – Emma Phillips (Global Facility for Disaster Risk Reduction GFDRR/World Bank)
  – Dickie Whitaker (OASIS)
  – Gari Mayberry (USAID)
  – Ricardo Mena (International Strategy for Disaster Reduction UN-ISDR)
Panel 2: Drivers and demands for the maps and models, strategic perspective

• Questions

What do you think the completion and availability of the Global Earthquake Model means to you, your organisation or stakeholders?
### Posters in Library

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<thead>
<tr>
<th>Category</th>
<th>Name</th>
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<td>SERA</td>
<td>Helen Crowley</td>
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<td>EMCA</td>
<td>Stefan Parolai</td>
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<td>Philippines Hazard Model</td>
<td>H. Peñarrubia</td>
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<tr>
<td>Philippines: Active Faults</td>
<td>Ruey-Juin Rau</td>
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<td>Global Active Faults</td>
<td>Richard Styron</td>
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<td>China Hazard Model</td>
<td>Changlong Li</td>
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<td>Italy Hazard Model</td>
<td>Carlo Meletti</td>
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<td>Switzerland Hazard &amp; Risk</td>
<td>Laurentiu Danciu</td>
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<td>Japan Hazard Model</td>
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<td>Santiago, Chile Haz. &amp; Risk</td>
<td>John Elliot</td>
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<td>Urban Risk, Colombia</td>
<td>Ana B. Acevedo</td>
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<td>Global Flood Model</td>
<td>Roberto Rudari</td>
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<td>Global Tsunami Model</td>
<td>Roberto Basili</td>
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<td>EDF</td>
<td>Jessie Mayor</td>
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<td>DRR Factors</td>
<td>Aneta Florczyk</td>
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<td>COMET</td>
<td>Alex Copley</td>
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<td>METEOR</td>
<td>Zheng-Hui Hu</td>
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<tr>
<td>METEOR</td>
<td>Colm Jordan</td>
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<td>UKSA IPP</td>
<td>Connor McSharry</td>
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<tr>
<td>Social Vulnerability</td>
<td>Chris Burton</td>
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<tr>
<td>Risk Model Interoperability</td>
<td>Claire Souch</td>
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<tr>
<td>GEM &amp; OASIS &amp; Sunstone</td>
<td>Malcolm Haylock</td>
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### Live Demos in PC Room

<table>
<thead>
<tr>
<th>Interactive Maps, OpenQuake engine &amp; QGIS Plugin</th>
<th>GEM IT Team</th>
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<tr>
<td>Aristotle</td>
<td>Alberto Michelini</td>
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### Live Demos in Music Room (upstairs)

<table>
<thead>
<tr>
<th>SafeHub</th>
<th>Kate Stillwell</th>
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<tr>
<td>Jumpstart</td>
<td>A. Thompson, D. Frazier</td>
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<tr>
<td>GEM Models &amp; Touchstone</td>
<td>Luis Sousa, Catarina Costa</td>
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<tr>
<td>GEM Models &amp; KatRisk</td>
<td>Stefan Eppert</td>
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</tbody>
</table>
Panel 3: Future Directions for models

• **Moderator:** Jochen Zschau-GFZ (ret.)

• **Panelists**
  – Colm Jordan (British Geological Survey BGS, and PI/METEOR)
  – Alex Copley (University of Cambridge, and COMET)
  – Roberto Basili (National Institute Geophysics & Volcanology INGV, and Global Tsunami Model GTM)
  – Andy Thompson (SafeHub)
  – Chris Burton (Auburn University, formerly GEM)
Panel 3: Future Directions for models

• Questions

- What do you think the completion and availability of the Global Earthquake Model means to you, your organization, your projects, or stakeholders?

- Where do you see future directions for GEM, specifically when using new, advanced technologies and reaching out beyond physical risk to socioeconomic impact?