Natural Resources Canada | Ressources naturelles Canada
Canada

GEM
GLOBAL EARTHQUAKE MODEL
working together to assess risk

# Earthquake Risk Modelling

## a bridge between knowledge and application

**Early beginnings: realizing the power of earthquakes to change communities**

I became interested in earthquakes at an early age. It was 1968, I was living in Istanbul Turkey with my family. We were having dinner when all of a sudden, the ground started to shake and things fell to the floor. It was a time of crisis in Istanbul and what struck me was the earthquake changed everything in just a few seconds.

People that were at war were all of a sudden in the streets together and I understood the power of earthquakes to change communities. That memory stuck with me. It has influenced my work as a research scientist and motivated a desire to help people understand what could happen in the event of a disaster.

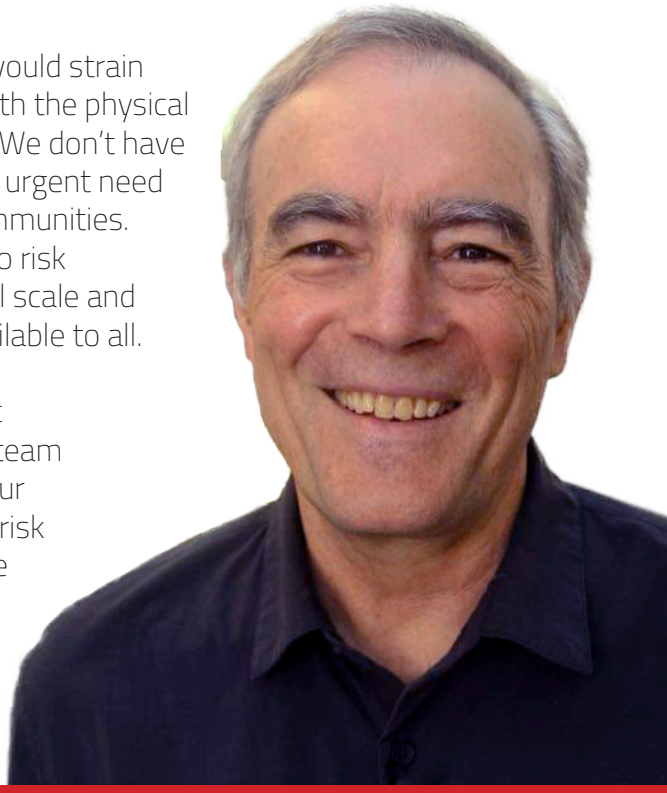
**First involvement with GEM, earthquake risk in Canada**

We know that there's potential for significant earthquakes on the west coast on Canada where I live. I work with the Geological Survey of Canada and was introduced to GEM about five years ago at a hazards and risk modeling workshop in Pavia. One of our mandates as a federal research agency is to generate a national earthquake risk assessment for Canada to help inform disaster risk reduction planning and policy development.

**GEM and Canada partnership**

A severe earthquake in any of the known hotspots of Canada would strain existing capacities to respond and recover so understanding both the physical and socio-economic risks at a national scale is a priority for us. We don't have a publicly available seismic risk model right now and there is an urgent need to develop a shared understanding at the level of individual communities. GEM provides a suite of tools and expertise that enable us to do risk assessments at all scales - at the national scale, at the regional scale and at the local scale using an open source set of tools that are available to all.

Our partnership with GEM enabled collaboration with academic researchers and partners from other organizations to create a team in Canada that is able now to do more than we could have on our own, So, as we progress in generating our national earthquake risk assessment we continue to learn from GEM and hopefully have something to offer back as well.



> By providing open source tools and providing access to a community of experts worldwide, GEM is really accelerating the way in which we think about and model earthquake risk globally.

> GEM is a change agent in many ways – the most important are the principles on which it's based- I think the open collaborative nature of GEM is a game changer in the field of earthquake risk modeling.

**Earthquake risk modelling as a bridge between knowledge and application**

GEM for me is a community of researchers who share a passion for telling stories about earthquake risks through the use of analytic models. These risk models are a bridge between our understanding of what could happen in the event of a large earthquake and what we can do about it.

And so for me working with GEM is working with people who understand in great detail the various aspects of earthquake risk modeling whether it's the hazard models or the vulnerability models, social vulnerability, earthquake risk - all these pieces need to come together in order for us to understand what could happen in the event of a disaster but most importantly what can we do in advance to reduce our risk to earthquakes in the future.

**GEM as change agent**

GEM is a change agent in many ways – the most important are the principles on which it's based- the open collaborative nature of GEM is a game changer I think in the field of earthquake risk modeling.

By providing open source tools and providing access to a community of experts worldwide, GEM is really accelerating the way in which we think about and model earthquake risk globally, in a way that we haven't been able to do within the context of individual organizations whether that be a national government organization or a private industry organization.

**Being part of GEM is like being in a jazz band**

For me being part of being part of the GEM organization is like playing music in a band. You can play classical music where everyone has a part to play and it's scripted and you play your instrument on the appointed time or you can play jazz.

And when you play jazz with fellow musicians or researchers you learn from each other. You listen to what they're doing, you learn from each other in the moment and your music becomes alive - it changes, it evolves very quickly. It inspires me to think about research as a creative design process. GEM is about bringing together the best science and the best people to advance the best research possible.

**Supporting GEM means more efficient international collaboration**

GEM is a nonprofit organization and it offers an invitation for public sector and private sector partners to join an international collaboration to improve our understanding of earthquake risk modeling and ultimately to understand risk better.

The incentive for us in Canada to become a member of GEM is pretty simple. The value proposition is very clear. It allows us to do things that we could

not do alone as an individual organization and I think many organizations are in a similar position these days.

We're all experiencing reduced funding for our research programs, reduced capacities to do the work that we're asked to do. In collaboration however, we have the potential to do this work more effectively. What GEM offers for us is a network of researchers who bring capacity beyond what we have within our own walls to do the work in a way that we couldn't have done otherwise.

**GEM as a platform for understanding multi-hazard risk in the future**

I think the value of being a public sector member of GEM is the opportunity to work together as part of a team – and to think about where this collaboration can go in the future. The communities that we work with certainly experience earthquake risk but they also face other hazards of concern: floods, debris flows, other kinds of hazards.

And the work that GEM is doing is leading the way I think toward how we as organizations can think about multi hazard risk in a coherent way and use the tools and platform that GEM has assembled over the last 10 years to take us into the future.

**About the GEM Impact Stories**

Earthquake risk remains abstract and highly technical, and there are significant risks due to poor or limited understanding of it. Because of this prevailing condition, policymakers and the public at large may not be able to fully take advantage of existing and future information that can either help create better or enhance existing earthquake risk reduction and management strategies, especially at the local and national level.

Specifically, the GEM Impact Stories project aims to:

- Collect and document stories where GEM or its partners have contributed to positive change
- Encourage policy and decision makers to use science- and evidence- based information to formulate earthquake DRR strategy at the national level through positive stories of change
- Increase awareness of the public at large on earthquake risk and preparedness

**Acknowledgement**

Our heartfelt thanks goes to: Dr. Murray Journeay for contributing his story and valuable time with us; Simona Confalonieri and her team at videografiaitaliana.it for the video interview; and Jill Dobkin for the photos and the support provided during the interview.