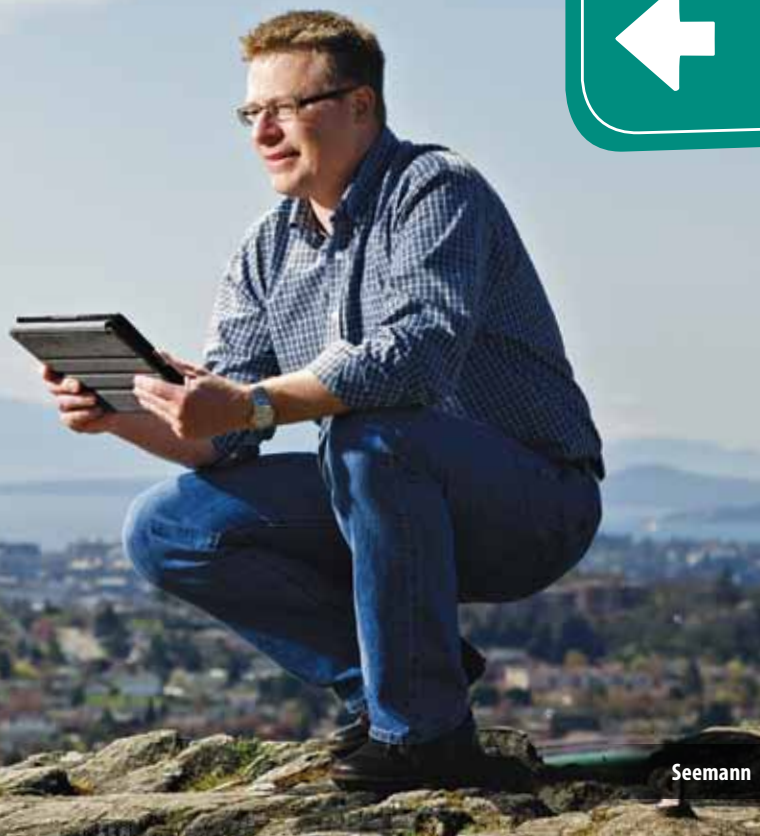


Shake, rattle and roll

A UVic geographer assesses earthquake hazard for Vancouver Island communities



Seemann

by Peigi McGillivray

We all know it's coming—the big earthquake that will shake our island to its core. But is there more than one earthquake threat, when exactly can we expect it, and what damage will it do?

Scientists have developed comprehensive and detailed hazard assessments that are pretty good at estimating the likelihood of earthquakes. The problem is that there's a gap between what scientists have learned and what communities, disaster management teams and local residents know.

"This communication gap can have potentially devastating consequences," says Mark Seemann, a PhD candidate in the University of Victoria's geography department. "Scientists often miss chances to simplify the information they have for the wider community." That's the problem Seemann is tackling in his research about earthquake shaking probabilities for communities on Vancouver Island.

To understand what kind of earthquakes are liable to happen here, Seemann examined existing information about seismic activity in 57 different communities around Vancouver Island.

"Seismic activity here is caused by the

buildup and release of pressure as the Juan de Fuca tectonic plate moves under the North American plate," he says. "I wanted to find out the likelihood of earthquake damage to communities across the Island."

Islanders don't just have to worry about "the Big One," which will be a subduction or "megathrust" event. There are also shallow earthquakes, called crustal earthquakes, and deeper sub-crustal earthquakes that will also cause damage. Seemann calculates the likelihood of ground-shaking from all three kinds of earthquake, and has developed an overall earthquake probability for each community. His simplified method refers to three shaking levels.

Widely felt shaking, which people indoors will feel, will cause buildings to tremble, doors and pictures to swing, and some dishes or glassware to break.

Non-structurally damaging shaking, which everyone indoors and out will feel, will cause damage to poorly built structures, including falling plaster and cracking walls and chimneys. There will be a lot of broken glassware and dishes, some windows will break, and furniture will be knocked down or overturned.

Structurally damaging shaking will make it hard for people to stay on their feet and will cause widespread alarm. Badly built structures

will suffer severe damage, and well-built structures will suffer minor damage.

While the whole of Vancouver Island is prone to earthquakes, says Seemann, the hazard is greatest in the scarcely populated northwest and in the south, where almost half of the Island's population lives.

"There is a 25 per cent probability that south Island communities will experience "widely felt shaking" in the next 10 years—a probability that rises to over 90 per cent over the next 100 years," he says. "The probability that the south Island will experience 'non-structurally damaging' shaking ranges from less than 10 per cent in 10 years to over 20 per cent in 100 years."

And the Big One? The probability of "structurally damaging" shaking rises from five per cent over 10 years to more than 30 per cent over 100 years.

Seemann's hazard information will help individuals and businesses assess their level of earthquake preparedness, assist elected officials with earthquake-related funding decisions, and inform municipal planners and emergency managers.

"Earthquakes are part of life on Vancouver Island," says Seemann, "but if everyone understands more about them, we can be better prepared."



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Are you earthquake prepared? Personal preparedness information is available through Emergency Management BC at bit.ly/MKrop1 and Public Safety Canada at www.getprepared.ca

A small delegation from UVic recently visited Christchurch, New Zealand, to learn about earthquake response and recovery at the University of Canterbury. There are many parallels between the two cities in terms of size, building structures and seismic risk. Since September 2010, Christchurch has been rocked by two major earthquakes and more than 10,000 aftershocks. Read more at bit.ly/christchurch-lessons.

Detection of major earthquakes and early warning of tsunamis from the NEPTUNE Canada network—part of UVic's Ocean Networks Canada Observatory—could be critically important to our region and our emergency responders. For more information visit bit.ly/neptune-earthquake

Research funding to UVic graduate students from the three federal granting councils and other external agencies has steadily increased over the last 10 years, to a total of \$4.8 million in 2010/11.



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