



Actuarial Risk Management
Global Actuarial Consultancy

**Strategies & Risk
Solutions for Executives**

To Our Subscribers

We want to thank our new subscribers and welcome everyone to the sixth issue of the ARM quarterly newsletter! During the past 3 months, our list of subscribers has reached a total of 300! We hope that you all find this publication valuable. With a few short articles meant to provide unique insights, we present ideas about how to address specific problems and introduce potential risks that may not yet be on your radar.

The primary authors are Dave Ingram and Max Rudolph. We have been active participants in the risk management, actuarial, investment and insurance spaces for many years.

Subscribers are encouraged to suggest topics for articles and ask questions of the authors during our follow-up webinars and podcasts. Ever cognizant of regulatory requirements, leveraging them to add value to your company in practical ways, will be our focus.

Published by Actuarial Risk Management (ARM), the Strategic and Risk Solutions for Executives (SRSE) subscription is free to all.

A free webcast is also available and our podcasts covering these topics is called [Crossing Thin Ice](#). If you would like to further engage the authors as consultants or for continuing education purposes, please reach out. More info can be found throughout this newsletter. We hope to help you find a solution that meets your needs!

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We hope you will join us on our journey!

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The content of this newsletter is meant to be educational and thought provoking. Nothing in it should be construed to be investment advice.

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Cascadia Earthquake

Many people think about earthquakes only where events have recently occurred: California, Japan and New Zealand come to mind for large events, and St. Louis, Washington, DC or New York City for smaller quakes that get written about for their novelty. A full discussion, for another day, would consider all seismic events, including volcanic activity.

Plate tectonics only became accepted about 50 years ago. Few of earth's processes are more important. Think of it as plates floating on the earth's core, directionally pushed by a seafloor spreading process that splits large plates and pushes them apart. Where these plates intersect, either passing against or under each other, pressure builds up and is released by earthquakes. The Ring of Fire around the Pacific Ocean is a group of subduction zones, where one plate passes under another, with both earthquakes and volcanos common.

While most have heard of the San Andreas fault that runs north and south in California, few outside of regional property insurance writers give much thought to the risk in Cascadia, where the Juan de Fuca Plate is slowly moving under the North American continent. It was not discovered until the 1980s so buildings prior to that were not built with earthquakes in mind.

The last known major earthquake occurred in 1700, before any European settlers had arrived in the region, and is estimated at about 9.0 on the Richter log scale. This date was determined from Indigenous oral histories and what had been an orphan tsunami in Japan. A ghost forest along the Pacific coast shows the impact of a sudden inundation



of sea water that killed all the trees very quickly in that year. The beach area where Lewis & Clark spent the winter of 1805-06 a century later is along the 600-mile fault line expected to experience a tsunami during such an event.

The long term mean between these strong quakes is nearly 250 years, making the next one overdue in purely statistical terms. It is a good example of what is becoming a common issue for pricing risk - coming up with assumptions for a future event where there is no historical data - termed an unknown known.

Subduction zones provide the necessary setting for volcanos. The Cascadia subduction zone forms several that are about an hour inland, including Mount St. Helens (erupted in 1980) and Mount Hood (mild eruption about 200 years ago).



Cascadia Earthquake (cont'd)

In the Pacific northwest subduction zone, the North American plate rises slowly to allow the Juan de Fuca plate to pass below. When the pressure is released the resultant earthquake is expected to cause the eastern part of the area to drop by about 6 feet and whipsaw the part of the plate that is below the Pacific Ocean. It will rise and then settle back into a stable position, but only after creating tsunamis both along the American coast and across the Pacific. Local deaths over 10,000 people in Washington and Oregon are expected and, given the number of buildings that are susceptible to a 9.0 magnitude earthquake, that seems low. Food, clean water and shelter will all be in short supply with diseases like cholera possibly becoming rampant. Some areas can expect landslides and liquefaction, including Seattle, where the land temporarily acts like quicksand. It will take years to rebuild infrastructure and the local economy, especially west of the I-5 north/south interstate highway.

An earthquake with magnitude potentially greater than 9.0 is a major disruption for those impacted. Similar events in the last century around the Ring of Fire have occurred in Chile (1960), Alaska (1964), Sumatra (2004), Japan (2011) and Kamchatka (1952). While the initial earthquake in the Pacific northwest will be catastrophic, the tsunami that follows could be 100 feet tall along the American coast and nearly 20 feet tall in Asia where similar events have pushed several kilometers inland in Japan.

The odds are greater than one in three for this type of event to occur in the next 50 years. Advance preparations, especially if the beaches are full of non-locals, are impossible but necessary. During such an event those who reach higher ground will live. Those who stop to help the injured, disabled, young, old and tourists will not. Having a go-bag and a plan matters, as does stockpiled supplies.

Insurers have several concerns due to earthquake exposure, from property damage, mortality and morbidity to asset defaults. Local direct writers will struggle to survive without reinsurance due to the concentration risk. The local economy will need infrastructure rebuilt, so capital infusions from institutional investors will be welcomed. Governments and aid agencies will help with necessities, but national resilience is low. There may be other crises underway that compete for resources. Earthquakes are like pandemics in one way - they are a matter of when, not if.



[Sign up for the associated June 22 webinar](#)



Strategic Risk Focus for Insurance Company Board Members and Executives

Two-part training program on May 24 and June 7 at 2 pm ET leveraging CGAD requirements to demonstrate the importance of risk management processes and the most common current concerns. Register for free: [Part 1](#) and [Part 2](#)

Additionally for a fee, we offer a private session customizing Part 1 and/or Part 2 to incorporate specific information that reflects your company's unique ERM program, key risks and Board role for just your Board members and Executives.

Part 1 (May 24)

ERM & Board Role

- General introduction designed for new board members and executives and as a refresher for current board members and executives who have been less involved in ERM in the past
- Primary components of Insurer ERM Program
- Fundamental Board roles in ERM

Part 2 (June 7)

Current Focus of Insurer ERM Programs

- Provides broad perspective on risks most concerning to over 200 insurance executives for 2023 (identified in ARM's Dangerous Risks Survey) and the level of ERM practice by over 60 insurers (from ARM's ERM Practices Study)
- Essential background for board members to provide meaningful oversight to management in the area of ERM

[Free registration for Part 2 here](#)



While Enterprise Risk Management is a continuous process, Own Risk Solvency Assessment (ORSA) and NAIC Corporate Governance Annual Disclosure (CGAD) require insurance company leaders to annually report on their risk management program including direct Board involvement.

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info@actrisk.com

1-512-345-5200

[Visit us on LinkedIn](#)

5914 West Courtyard Drive,
Suite 190. Austin, Texas 78730



Strategies & Risk Solutions for Executives

Now providing three ways for you to get insights, strategies and solutions from ARM consultants to help resolve your risk issues.

Newsletter

- 3 to 6 articles quarterly
- Written by Dave Ingram, Max Rudolph and other ARM consultants focusing on risks faced by insurers and risk management strategies
- Available on the ARM website

Webcast

- One-hour live webcast once each quarter following the newsletter publication
- Webcast includes brief presentations, interviews with authors and live Q&A with your questions answered regarding the newsletter topics

Podcasts

- Two per month
- Delivered by Dave Ingram & Max Rudolph
- Presenting material from the newsletters and webcasts in a totally audio format.
- Available wherever you usually download podcasts

* No charge to subscriptions to all three services



While insurers have been challenging by low interest rates and the pandemic, the next few years will see a radically changing environment for insurers. We will be using this provocative platform to identify emerging risks and delve into what we see as the drivers of future success.

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