Pacific ring of fire map new zealand

The ring of fire is a belt of active volcanoes and tectonic plate boundaries that line the Pacific Ocean.While its name suggests it is a circle, the ring of fire, which extends 40,000 km and consists of 452 volcanoes, shaped like a horseshoe. The loop stretches from the southern tip of South America, up and along the coast of North America, through the Bering Strait and through Japan and then south to New Zealand. Associate Professor Mark Quigley, who specialies in earthquake science at the University of Melbourne, said the Ring of Fire was named because of volcanic activity around the Pacific Plate boundary. Two people have been killed after a 7.5-intensity earthquake struck New Zealand. (AAP) It is old, cold, ocean crust, so it is quite dense and heavy. So when it is against other tectonic plates, it tends to sink. So it sinks and melts in the man cover and the product of that melt rises through that crust, that magma, and they erupt in volcanoes. He said the largest earthquake in the world had occurred around the Ring of Fire. There was an earthquake in the 60s in Chile, a 9.5 intensity - it was the biggest earthquake we've ever had. But in recent times, the 2011 Tohoku earthquake in Japan has been on the plate boundary. Prof Quigley said because New Zealand was also in the Ring of Fire, he was not surprised by the 7.5 magnitude earthquake that struck the country's South Island shortly after midnight on Monday. The quake occurred at the diffusion plate boundary between the Pacific Ocean and the Australian Plate, he said. MORE STORIES ABOUT FIRE RINGS So that if we know where earthquakes are likely to occur, can scientists predict when they will happen? No, Professor Quigley said. We are not at a stage where we can provide accurate time information at a resolution that will be useful for evacuation and so on. The last major eruption was Mount Ruapehu in 1995-1996, which generated more than 200 claims for the EQC totaling several million dollars. And although the risk of another major eruption in our lives is quite distant, volcanoologists say small and medium-sized eruptions are almost a certainty, and a ready framework involving scientists, insurers and governments is always in place. The insurance business spoke to GNS Science volcanoesman Brad Scott, and the earthquake commission's (EQC) head of strategy and resilience research, Dr Jo Horrocks about New Zealand's volcanic risk, preparation strategy and its uniquely robust insurance framework. New Zealand volcanoes are home to three main types of volcanoes: auckland volcanic fields, conical volcanoes and craters, also known as super-volcanoes. According to Brad Scott, each of these throws up their own unique kind of risk as they each have different 'back-to-time' and erupting effects, and some are much harder to plan for than others. Auckland volcanic fields include volcanoes in random locations with random timing, Scott explains. The big problem is that we know a lot about the dangers, but we don't know where the latest volcano will be. So we can't do a lot of specific plans. The second type is a conical volcano, and that's what most people imagine a volcano to be - Ruapehu, Ngauruhoe, Taranaki, White Island, etc., he continued. These are much easier to deal with because we know where the vents are, they have been active for thousands of years, so we can put a dot on the map and do some specific plans around it. The third type is a crater, or super-volcano. These are large systems with a large amount of melting material. The Rotorua Basin is a prime example – 20-odd kilometers across, and it's a single crater that erupted 200kms of material 230,000 years ago. Scott says the craters produce two different types of eruptions, and therefore two very different styles of problem. The first is that eruptions form craters in the first place - extremely rare, usually occurring once every 50,000 - 100,000 years. But once formed, they also saw some volcanoes revive about every 2,000 years. These can be quite large eruptions in their own right with a significant impact, and volcanic instability tends to occur every 50-100 years. Taupo has had 17 episodes of 'unrest' since 1930, and in the worst case, the area has evacuated itself due to earthquake activity and ground deformation. How will we know when an eruption is coming? According to Scott, the great thing about volcanoes is that they will all raise their hands before erupting. They are not silent, instantaneous events, and this means that there is always a good piece of warning time before anything destructive happens. GNS is currently monitoring three main factors: earthquake activity, ground deformation and water and gas chemistry. Moving the melting material will cause the ground beneath the volcano to swell and vibrate, gas and geothermal systems will make a whole lot of noise, and hot stones will heat the water and turn it into steam. The volcano has become quite noisy, and so we get a good idea that it's one and what it's up to, Scott said. But there's a lot of change. We have documented volcanic unrest that took more than 20 years to erupt, and several volcanoes appeared for three weeks. Some data for Auckland suggests it could be as short as 10 days. The challenge for us was to realize that the volcano had raised its hand. What will the damage be? In terms of damage, there are two main types - vandalism 'near source' of damage, and ashfall over a radius of 4-8km. The near-source impact involves a cannonball-style explosion, lava flows, debris and avalanches. Scott says that each of these hazards is completely destructive, so, as a general rule, everything in the 4-8km bracket will be affected or badly destroyed. Beyond that, ashes fire is usually a nuisance but can infrastructure, homes, power lines and water supplies. This will then become a cleanup problem. The building code in New Zealand is designed for about 200mm of snow, and volcanic ash has a similar density, Scott explained. As a result, most buildings will be able to withstand that. How are we prepared? Dr Jo Horrocks of the EQC said there had been a clear focus on seismic risks over the past few years, but now was a good time to consider how New Zealand would deal with this kind of natural hazard. The EQC is currently covering for housing and soil damage to all natural hazards, including volcanic activity. A preparing strategy is in place, and a declared strategy is being developed from the Kaikoura earthquake response, where private insurers have been at the fore in dealing with claims. It's really imperative that we understand the nature of volcanic risk, and we are currently working with private insurers to develop an industry-full strategy, Horrocks said. We want to establish a way to manage complaints and provide the best experience for our customers. Looking back at Canterbury, that reaction is probably not optimal on either of those fronts, so we're asking how we can make sure that doesn't happen again. Does that apply whether it's an earthquake, volcano, landslide, etc. What is the best way we can manage the public-private insurance model that we have in New Zealand? Horrocks says research and education are also an important part of that strategy, as well as looking abroad at other countries with high volcanic activity, such as Japan or Chile. However, she says New Zealand has a unique thing going for it, and that's the extremely high level of coverage. New Zealand actually has its public insurance working in its favor, she explains. Our insurance penetration is much higher than in other countries – about 90% right now, and that level of coverage is unprecedented worldwide. Currently, New Zealand's volcanic warning system uses five levels to assess the status of each volcano. These levels are: 2 - Medium to high instability Currently, White Island and Ruapehu are the only volcanoes at a warning level, but Brad Scott says they are known to bounce between levels one and two. Ruapehu's 1995-1996 eruption was classified as level four, and there have been three such-sized eruptions in recorded history. The elephant in the room was Taranaki, Scott said. It's a large conical volcano with important oil and gas and agricultural infrastructure around it, so that could be a problem. It has a back time of about 300-500 years, so it's a moderate possibility in our lifetime. Ngauruhoe has done nothing in 30 years, although before that it was never more than nine years without a significant eruption. So there are many change, and different types of volcanoes have different time and back cycles. However, New Zealand can expect small to medium-singly eruptions in 100-year planning cycle. That's what's been given.