



Cities on Volcanoes 9  
November 20-25, 2016  
Puerto Varas, Chile

*'Understanding volcanoes and society: the key for risk mitigation'*



## **Investigating the consequences of an Auckland Volcanic Field eruption using a scenario**

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Auckland Volcanic Field, urban volcanism, scenario, infrastructure, level of service

New Zealand's largest city, Auckland, is built on top of the Auckland Volcanic Field (AVF). Although there are no definite trends to forecast where, when, or how big the next eruption will be, the AVF will, almost certainly, erupt again. To explore the potential consequences of an AVF eruption, we developed a hypothetical scenario of a month-long eruption. In consultation with civil defence and emergency management staff, we created a series of evacuation maps for before, during, and after the hypothetical eruption sequence. As we were interested in the ramifications of an AVF eruption for infrastructure services, we modelled scenario eruption impacts and resulting service disruption for ten key critical infrastructure sectors (electricity, fuel, road network, rail network, aviation, port services, water supply, wastewater, stormwater, and telecommunication). We then met with infrastructure providers to verify and revised our findings. Our final output was a series of level of service (e.g., outage) maps for each sector. Although the hypothetical eruption finishes within one month, its ramifications would continue for months and in some cases years. Most of the damage to infrastructure would result from the initial pyroclastic surge, with later tephra fall causing further power disruptions and requiring substantial clean-up efforts. However, some sectors would experience reduced or compromised services before the eruption due to network protection measures and site access issues resulting from evacuation orders. Although we did not consider interdependencies between sectors, our meetings with infrastructure providers confirmed that transportation and electricity are two key sectors on which other sectors are critically reliant. Our results likely underestimate the duration of reduced levels of services. Our hypothetical scenario highlights the challenges likely faced during an AVF eruption. In



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addition to managing a displaced population, responding agencies will confront a considerable reduction in available critical infrastructure services for months to years.