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## Cascading Effects of Extreme Geohazards on Tenerife (Canary Islands)

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Extreme geohazards (volcanic eruptions, earthquakes, landslides and tsunamis) have the potential to inflict cascading effects whose associated risks are difficult to predict and prepare for. Thus, these events are generally not taken into account in hazard assessment. Anticipating the occurrence of such extreme events is thus key if our life-styles are to remain safe and sustainable. Volcanic islands are often the source of complex successions of disastrous events, as is evident from any examination, for instance, of the geological record of regions such as Hawaii, the Canary Islands, Reunion and Indonesia. The island of Tenerife in the Canary Archipelago is an excellent example of where cascading extreme hazards have occurred several times in the past and could occur again in the future. A cascading sequence involving a caldera-forming eruption, high-magnitude seismicity, mega-landslides and tsunamis occurred at least twice during the construction of this island. In order to understand the possible consequences of such processes if they were to reoccur, we simulated the extent and potential impact of a multiple, extreme geohazard episode similar to the last recorded one that took place on the island of Tenerife around 180 ka. If this event were to occur today, the PDCs resulting from the collapse of the eruptive column would devastate nearly the entire island. The caldera collapse would generate high-magnitude seismicity that would severely affect the central part of the island, corresponding to the caldera of Las Cañadas and its walls, the Icod Valley, the NE and NW rifts, and Bandas del Sur in the southeast. Seismic shocks could trigger a mega-landslide in the current Icod valley that would mobilise a thickness of about 500 m. The impact of this mass against the ocean would generate a first tsunami wave up to 200 m high that would sweep the coasts of the north of Tenerife in less than 10 minutes. This is probably the most catastrophic scenario for this region, and it sets a maximum limit to the range of situations that may occur in Tenerife in order to design a better risk management in this island without exceeding with minor events or falling short in case of events of greater impact. The implications of such a disastrous succession of events are analysed at local, regional and global scales, and the results obtained are discussed within the framework of disaster risk-reduction policies.