

## Near real-time hazard assessment during the 2011-2012 eruption of Puyehue-Cordon Caulle volcano, Southern Chile.

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The Puyehue-Cordon Caulle complex (40.6°S, 72.1°W) is one of the most active volcanic complexes in the southern Andes, where both explosive and effusive eruptions have occurred during historical times. During late May - early June 2011, the Chilean monitoring network detected increasing precursory seismicity, which resulted in a new eruption on June 4, 2011. The initial phase of the eruption was characterized by a Plinian-like eruptive column that lasted for more than 24 hours, resulting in widespread tephra deposits in Chile and Argentina with an estimated volume of ca. 0.5 km<sup>3</sup> of magma (DRE). On the other hand, fine ash disrupted air navigation across the Southern Hemisphere for several days. From mid-April 2011 to March 2012, the eruption was characterized by the emission of blocky lava of similar volume to historical lava flows (< 1 km<sup>3</sup>). Additionally, simultaneous fine ash emission derived from weak plumes caused several flight suspensions in Chile and Argentina. The Volcano Hazards Program at SERNAGEOMIN developed a dynamic approach in order to generate hazard maps using numerical models, taken into consideration the evolution of the eruption. During the explosive phase, sub-daily reports of potential tephra accumulation on the surface were done using an advection-diffusion model (ASHFALL) and forecast wind fields. In addition, all through the eruption areas susceptible to be inundated by lahars were delineate using the LAHARZ model, whereas areas susceptible to be impacted by pyroclastic density currents where estimated according to the energy cone method. Based on field and seismic observations as well as available satellite imagery, inputs for the models were calibrated and therefore hazard maps were updated, allowing timely information for civic officials.