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Impacts of ash resuspension in the rural Patagonia community of Ingeniero Jacobacci, Argentina associated with the 2011-2012 Cordón Caulle eruption

Pablo Forte¹, Costanza Bonadonna², Christopher Gregg³, Lucia Domínguez², Deanne Bird⁴, Donaldo Bran⁵, and Jonathan Castro¹

1Character field too short. I will send affiliation of authors by email to the conveners of the session.

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Hazards associated with dispersal and sedimentation of primary volcanic ash during eruptions is well documented in the literature; but less attention has been devoted to characterization of ash as a secondary hazard when resuspended. Despite the relative dearth of research on ash resuspension, the phenomenon has been documented in several areas after volcanic eruptions of Mount Saint Helens (1980, USA), Mount Hudson (1991, Chile) and more recently, Eyjafjallajökull (2010, Iceland), Grímsvötn (2011, Iceland), Cordón Caulle (2011, Chile) and Calbuco (2015, Chile). The 2011-2012 Cordón Caulle eruption emitted about 1 km³ of rhyodacitic tephra. Dominant westerly winds in the region caused most of the primary ash to deposit in nearby Argentina. In addition to the impact of widespread dispersal and fall out of primary ash during the eruption, Argentina was also significantly affected by the remobilization of the primary ash even several months after the climactic phase. In this study we assessed the impacts related to the secondary ash resuspension in a farming community in the Argentinian Patagonian steppe (i.e., Ingeniero Jacobacci) and compare it with the impacts related to primary tephra fallout. Despite its distance to Cordón Caulle volcano (~250 km), Ingeniero Jacobacci was severely affected during the 2011-2012 eruption. Furthermore, the environmental conditions of this region (i.e. mostly lack of vegetation and of precipitation) make it especially susceptible to post-eruptive ash resuspension events. In addition to the impacts of ash resuspension, we also assessed levels of hazard awareness and preparedness using a written questionnaire and in-person interviews. The target population was composed of farmers in and around Ingeniero Jacobacci.