

Impacts after the 2015 Calbuco eruption in Argentina and their relation to tephra deposit characteristics and climatic variables

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The April 2015 Calbuco eruption produced an ash cloud that drifted N-NE reaching the Argentinean territory in a few hours. Due to particular atmospheric conditions, the plumes from the first and second eruptive pulses persisted over Neuquén province for several hours. About 140.000 km² were covered in Argentina with up to 24 mm thick tephra composed of bimodal fine ash. Tephra distribution and climatic variables (high W-E precipitation gradient, dominant strong westerly winds) favored frequent and massive ash resuspension events in central Neuquén, comparable to the situation of central Rio Negro province after Cordon Caulle (CC) 2011 eruption. XRD analyses disagreed with the significant presence of cristobalite indicated in early reports. The impacts were investigated in three towns along the axis of the deposit and related to tephra characteristics and climatic variables. Damage to infrastructure, increase in turbidity and changes in pH were recorded in water supplies, as well as problems in wastewater treatment systems caused by wearing of equipment and clogged filters. Adaptation of the insulators introduced after the 2011 CC eruption prevented significant impacts from adhered ash on electricity transmission lines. Economic activities in touristic towns were significantly affected, with a sharp decline of ~50% in hotel occupancy observed during May 2015. Many cases of bronchitis, bronchiolitis and asthma were reported, particularly in Junín de los Andes (JLA) where severe conditions were caused by wind resuspension of ash. The 2011 CC eruption led to a change in volcanic risk consciousness in the most affected localities such as Villa La Angostura (VLA). Though it is still necessary to enhance the emergency preparation and reduce the exposure of critical infrastructure to ashfall events in the region, preparedness and response to the 2015 Calbuco



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crisis proved to be more effective in JLA with respect to JLA and other
previously unaffected towns