



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

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



Impact of the Andean orography on HYSPLIT forecasts of volcanic ash dispersion: Sensitivity tests using the WRF-ARW and Eta models.

Tamara Schonholz¹ and Leonardo Mingari^{1,2}

¹Servicio Meteorológico Nacional, Argentina

²Instituto de Física de Buenos Aires - CONICET

Keywords: volcanic ash, orography, HYSPLIT, dispersion, VAAC

Buenos Aires Volcanic Ash Advisory Centre (VAAC), depending on the Argentinean National Meteorological Service (SMN), is responsible for providing Volcanic Ash Advisories (VAA) whenever a volcanic event occurs in their area of responsibility. The Hybrid Single-Particle Lagrangian Integrated Trajectory model (HYSPLIT) is used operationally by the VAAC in Buenos Aires to forecast the transport and dispersion of volcanic ash. Currently, the HYSPLIT model is driven by GFS forecasts. However, in order to simulate a reasonable spatio-temporal distribution of volcanic ash concentration it is necessary to use a regional model. In this work we conducted numerical simulations of volcanic ash dispersion in the environment of the Andes Mountain range using the HYSPLIT model driven by Eta and WRF-ARW simulated atmospheric fields. Currently SMN runs operatively Eta model with a horizontal resolution of 30 km and plans to migrate to an operational implementation of the WRF model for the near future. A successful description of the transport of volcanic ash represents a challenge due to the extremely complex orography of the region. It is expected that the Eta model has better performance in areas of steeply sloping terrain, due to errors in computing the horizontal pressure gradient force in models using a terrain-following vertical coordinate, such as the WRF model. The differences in both models could be substantial in the vicinity of steep topography.