Cities on Volcanoes 9
November 20-25, 2016
Puerto Varas, Chile
'Understanding volcanoes and society: the key for risk mitigation'

Improvements on Remote Sensing for Volcanic Ash Detection based on the 2011 Eruption of Puyehue Cordón Caulle Volcanic Complex (PCCVC)

Toyos, G.[1]

[1]Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) con lugar de trabajo en la Comisión Nacional de Actividades Espaciales (CONAE)

Keywords: remote sensing, volcanic ash detection, satellite image classification, MODIS, Cordón Caulle

The advances on the development of a multi-band algorithm that exploits the spatial statistics of MODIS data acquired during the first period of the 2011 eruption of the Puyehue Cordón Caulle Volcanic Complex are presented. Based on a dataset that covered the period 4 – 20 June 2011, the aim was to evaluate different approaches for image classification by using as input the brightness temperature (BT) at 11 µm and the brightness temperature differences (BTDs): BTD (11 - 12 µm), BTD(11 - 8.5 µm) and BTD(11 - 3.9 µm). The methods evaluated include: (i) the application of thresholds based on spatial statistics of the BTs and BTDs of volcanic ash, meteorological clouds and clear sky above land and sea and (ii) principal component analysis (PCA) and subsequent evaluation of spatial statistics as in (i) but using the PCA axes instead of the BTs and BTDs. The plan is to extend this analysis in time and to consider other eruptions such as V. Chaitén (2008) and V. Calbuco (2015). The results of this study will serve as the basis for an automatic procedure, which operational implementation is expected at CONAE in the near future.