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[Arabian Journal of Geosciences](#)

February 2017, 10:94| [Cite as](#)

# Monitoring the 3-year thermal signatures of the Calbuco pre-volcano eruption event

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Original Paper

First Online: [23 February 2017](#)

## Abstract

The use of remote sensing to monitor volcanic eruption may not be very accurate. In this paper, we seek to describe supportive techniques to aid the efficiency of remote sensing in monitoring and predicting eruptions. The last three volcano eruptions in Calbuco occurred in 1961, 1976, and 2015. Calbuco is located on latitude 41.33 S and longitude 72.62 W. The duration of the research is 3 years before the eruption, that is, 1958–1960, 1973–1975, and 2012–2014. The specified duration was examined using the thermographic model and  $k$  factor analysis that is aided by the Global Land Data Assimilation System (GLDAS), Landsat 8 OLI, Mosaic, and ETM imageries. This study adopts the thermal analysis parameters which includes average surface temperature, ground heat flux, latent heat flux, sensible heat flux, surface temperature at ground layer 3, surface temperature at ground layer 10, net longwave temperature, and net shortwave radiation. The combination of remotely sensed measurement with the chosen techniques corroborates each other with salient discoveries like the  $k$  factor properties, the period of thermal signature retrieval from either the satellite and ground observations or the cup-like ripple effect whose base is found at the lineament beyond the volcanic site.

## Keywords

Volcanic eruption Magma Heat flux Heat transport  $k$  factor test Calbuco

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