

## **Living in the shadow: a neighbourhood classification approach to volcanic vulnerability in Quito**

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Lying 10km west of Ecuador's capital, Quito, Guagua Pichincha is the 4784m stratovolcano that casts a daily shadow over the city. Though currently in repose, the volcano has displayed a violent history with three major Plinian eruptions in the 1st, 10th and 15th centuries (Robin et al 2008). These events have included significant pumice discharge, tephra fall and lahar flows (Hall 1977, Simkin et al 1994, Canuti et al 2002) with some of these instances impacting areas that now lie within the highly populated city limits. An eruptive phase between 1999-2001 provided a reminder that Guagua Pichincha remains a very real danger as the city was put on 'yellow alert' and thousands of houses were coated in a fine layer of ashfall. With hundreds of thousands of Quitenos living in informal and often peripheral barrios

, some of the most disenfranchised Ecuadorian communities are settled around the edges of Quito city and more significantly, in close proximity of the volcano. By reconstructing the spatial impact of historical volcanic ashfall at critical vulnerability thresholds, this paper is concerned with analyzing the social vulnerability and demographics of those neighbourhoods that could be significantly impacted by a future Plinian eruption. As well as using multivariate statistics to identify commonalities in Quito barrios, this paper questions the political, cultural and environmental factors that drive many Quitenos to live in these areas of the city.

Geodemographics and spatial analysis are combined to provide insight on possible DRR (disaster risk reduction) measures, future communication strategy and public policy in Quito's metropolitan areas.

Canuti, P., Casagli, N., Catani, F., Falorni, G. 2002. Modeling of the Guagua Pichincha volcano (Ecuador) lahars. *Physics and Chemistry of the Earth, Parts A/B/C*. Volume 27, Issue 36, 2002, Pages 1587-1599.

Hall, M.L, Mothes P.A. 2008. Quilotoa volcano - Ecuador: An overview of young dacitic volcanism in a lake-filled caldera. *J. Volc. Geotherm. Res.* 176(1):44-55

Simkin, T., Siebert, L., McClelland, L., Bridge, D., Newhall, C. G., & Latten, J. H. (1994). *Volcanoes of the World*. Smithsonian Institution.