

Vita

Candidate's name: Lyzeth Johana Gomez

Universities
Attended: University of Caldas - Manizales (2014)
Bachelors of Science
Geology

University of New Brunswick (2021)
Masters of Science
Earth Science

Presentations:

"Determination of magma emplacement and remobilization times using zoning of Sr, Br and Pb in plagioclase phenocrysts, Galeras volcano, Colombia." Atlantic Geoscience Society, 46th colloquium and annual general meeting, 2020.

"The plumbing system of a DECADE volcano: field and petrologic studies of the Galeras volcano, Colombia" Atlantic Geoscience Society, 45th colloquium and annual general meeting, 2019

"Geological and evolutionary history of the Galeras Volcano", based on the stratigraphic methodology for the geological mapping of volcanic areas, proposed by F. Lucchi for southern Italy volcanoes. December 2018.

"Landslide Hazard and Risk Zoning Connected to Torrential Floods in the Encano (Department of Nariño-Colombia). Scale 1:25000". November 2015.

"Variations in the Attenuation of Seismic Waves in the Nevado del Ruiz Volcano Associated with its Recent reactivation 2010-2014". September 2014. III Latinoamerican congress of seismology. July, 2014.

Characterization of recent pyroclastic density currents and determination of magma residence times in historic and pre-historic eruptions of Galeras volcano, Colombia: A contribution to the hazard assessment

UNIVERSITY OF NEW BRUNSWICK

THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of
Master of Science

by

Lyzeth Johana Gomez

in the Department of Earth Science

U.N.B., Fredericton, N.B.

**Monday, May 17th, 2021
11:00 a.m.**

Via MS TEAMS

Examining Committee

Dr. Cliff Shaw
Dr. Allison Enright
Dr. Viqar Husain
Dr. Audrey Limoges

Supervisor
Internal Examiner
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Abstract

Textural and chemical patterns in plagioclase phenocrysts of three pre-historic and two 21st century eruptions of the andesitic Galeras volcano, Colombia, have been used to determine the residence time of magma within the subvolcanic system. Near-equilibrium, oscillatory zoned plagioclase and variably textured zones indicating dissolution / resorption, evidence changes in pressure, temperature, composition, and magma flux during crystal growth. Modelling of Sr and Ba diffusion in plagioclase, which crystallized at an average temperature of 975 °C, indicates that all five eruptions preserve evidence of at least two phases of magma chamber development. Oscillatory zoned grains give magma residence times of 10 to 81 years. Grains with disequilibrium textures always indicate a much shorter residence time in the subvolcanic chamber, generally less than 10 years. These results suggest that the initial magma chamber received additional fluxes of phenocryst bearing magma no more than a decade before eruption.