



## Workshop "Seventeen years (1999-2016) of eruptive activity at the Tungurahua andesitic volcano"

September 28<sup>th</sup> - October 1<sup>st</sup>, Baños - Ecuador

### Program

Saturday 28 <sup>th</sup> , September 2019	13h00	13h30	Registration		
	14h00	14h20	Workshop Opening (Silvana Hidalgo)		
	<b>Session 1: Geological and petrological process</b>				
	Conveners: S. Hidalgo and P. Samaniego				
	<i>Time</i>		<i>Participant</i>		<i>Title</i>
	14h20	14h40	<b>Jean-Luc Le Pennec</b> <i>Institute de Recherche pour le Développement</i>		Radiometric and volumetric analyses of multiple growth and collapse of Tungurahua volcano
	14h40	15h00	<b>Minard Hall</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>		PDCs of the August 2006 eruptions of Tungurahua volcano
	15h00	15h20	<b>Pablo Samaniego</b> <i>Laboratoire Magmas et Volcans - Institute de Recherche pour le Développement</i>		Unraveling magmatic processes associated with the 2006 explosive eruptions of Tungurahua volcano (Ecuador): insights from petrological data of eruptive products and phase equilibrium experiments
	15h20	15h40	<i>Coffee break</i>		
	15h40	16h00	<b>Francois Nauret</b> <i>Laboratoire Magmas et Volcans - Université Clermont Auvergne</i>		The genetic relationship between andesites and dacites at Tungurahua volcano, Ecuador
16h00	16h20	<b>Natasha Sainlot</b> <i>Laboratoire Magmas et Volcans - Université Clermont Auvergne</i>		Pb-Sr isotope temporal variations on juvenile ash samples from the last eruptive period of Tungurahua volcano (1999-2016)	
16h20	16h50	Discussion			

<b>Saturday 28<sup>th</sup>, September 2019</b>	<b>Poster Session</b>			
	<i>Time</i>		<i>Participant</i>	<i>Title</i>
	<b>16h50</b>	<b>18h30</b>	<b>Stephen Hernandez</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Seismic velocity changes at Tungurahua Volcano, Ecuador dynamically triggered by large regional earthquakes
			<b>Cristina Ramos</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Lahars detection network in Tungurahua volcano: Evolution and results
			<b>Cristina González</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Instituto Geofísico database architecture
			<b>Jorge Aguilar</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Overview of IG-EPN data acquisition, integration, database and web services
<b>Dayana Yaguana</b> <i>Carrera de Ingeniería Geológica - Escuela Politécnica Nacional</i>			Morphological changes of the crater in the Tungurahua volcano, Ecuador, from 2002 to 2016: Implications for volcanic hazards	

<b>Sunday 29<sup>th</sup>, September 2019</b>	<b>Session 2: Geophysical Monitoring and early Warning at Tungurahua</b>			
	<b>Conveners: P. Mothes and M. Ruiz</b>			
	<i>Time</i>		<i>Participant</i>	<i>Title</i>
	<b>08h00</b>	<b>08h20</b>	<b>Jonathan Lees</b> <i>University of North Carolina</i>	Seismo-acoustic Investigations on Tungurahua: a Laboratory for Volcano Dynamics
	<b>08h20</b>	<b>08h40</b>	<b>Jeffrey Johnson</b> <i>Boise State University</i>	On the lessons learned from 17 years of infrasound monitoring at Tungurahua
	<b>08h40</b>	<b>09h00</b>	<b>Mario Ruiz</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Seismo-acoustic patterns during eruptive activity of Tungurahua volcano
	<b>09h00</b>	<b>09h20</b>	<b>Indira Molina</b> <i>Universidad de los Andes</i>	Explosive activity of the Tungurahua volcano, Ecuador, inferred from acoustic and seismic waveforms analyses the temporal evolution of the source
	<b>09h20</b>	<b>09h40</b>	<b>Pablo Palacios</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Seismo-acoustics of paroxysmal eruptions of Tungurahua volcano
	<b>09h40</b>	<b>10h00</b>	<i>Coffee break</i>	
	<b>10h00</b>	<b>10h20</b>	<b>Jean Battaglia</b> <i>Laboratoire Magmas et Volcans - Université Clermont Auvergne</i>	Tectonic and volcano-tectonic events recorded below Tungurahua volcano between 2013 and 2018
	<b>10h20</b>	<b>10h40</b>	<b>Andy Bell</b> <i>University of Edinburgh</i>	New insights in to the nature of volcanic processes from low frequency earthquakes at during the eruption of Tungurahua volcano, 2013-2016
	<b>10h40</b>	<b>11h00</b>	<b>Patricia Mothes</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Flank Deformation of Tungurahua Volcano, 2006 to 2019
<b>11h00</b>	<b>11h20</b>	<b>Silvana Hidalgo</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Overview of SO <sub>2</sub> degassing at Tungurahua volcano	
<b>11h20</b>	<b>11h50</b>	Discussion		

<b>Sunday 29<sup>th</sup>, September 2019</b>	<b>12h00</b>	<b>13h30</b>	<i>Lunch</i>		
	<b>Session 3: Contributions and teachings of volcanophysics in the follow-up of a long lasting volcanic eruption</b>				
	<b>Conveners: J.L. Le Pennec and B. Bernard</b>				
	<i>Time</i>		<i>Participant</i>		<i>Title</i>
	<b>13h30</b>	<b>14h00</b>	<b>Raffaello Cioni</b> <i>Dipartimento Scienze della Terra, Università di Firenze, Italy</i>	Microtextural analysis of volcanic pyroclasts: insights on eruptive dynamics	
	<b>14h20</b>	<b>14h40</b>	<b>Jean Luc Le Pennec</b> <i>Institute de Recherche pour le Développement</i>	Bulking and Fines Production in Pyroclastic Density Currents at Tungurahua volcano	
	<b>14h40</b>	<b>15h00</b>	<b>Julia Eychenne</b> <i>Laboratoire Magmas et Volcans - Université Clermont Auvergne</i>	The August 2006 tephra fall deposit: insights into eruption dynamics and magma partitioning	
	<b>15h00</b>	<b>15h20</b>	<b>Elizabeth Gaunt</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	The July 14 <sup>th</sup> 2013 vulcanian explosion at Tungurahua Volcano: Pre-explosive conduit conditions	
	<b>15h20</b>	<b>15h50</b>	Discussion on eruptive dynamic, is the classical eruption classification scheme adapted to Tungurahua volcano?		
	<b>15h50</b>	<b>16h10</b>	<i>Coffee break</i>		
	<b>16h10</b>	<b>16h30</b>	<b>Silvia Vallejo</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	VolcFlow numerical simulation for pyroclastic density currents and lava flow at Tungurahua volcano	

<b>Monday 30<sup>th</sup>, September 2019</b>	<b>08h10</b>	<b>18h00</b>	<b>Fieldtrip: Tungurahua volcano deposits, communities and Vigías</b>	
	<b>Leaders: J.L. Le Pennec, P. Ramón, M.L. Hall, P. Mothes, B. Bernard</b>			
Visit of several key outcrops in the northern and western flanks of the volcano, with emphasis on the past and present eruptive activity. We also focus on the effects of the 2006 paroxysm, as well as on exposure to volcanic hazards by local populations				

Tuesday 1<sup>st</sup>, October 2019

## Session 4: Hazard and risk assessment and early warning systems

Conveners: H. Yepes and P. Ramón

<i>Time</i>		<i>Participant</i>	<i>Title</i>
08h00	08h20	<b>Patricio Ramón</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Twenty years of the Tungurahua Volcano Observatory during the 1999-2016 eruptive period
08h20	08h40	<b>Hugo Yepes</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Communicating the hazard and managing the risk: the Vigías
08h40	09h00	<b>Pablo Palacios</b> <i>Instituto Geofísico - Escuela Politécnica Nacional</i>	Indices used for monitoring the internal activity of Tungurahua volcano 1999 - 2019
09h00	09h15	<b>Pablo Samaniego</b> <i>Laboratoire Magmas et Volcans - Institute de Recherche pour le Développement</i>	Continual improving of the Tungurahua volcano's hazard maps during the ongoing eruptive activity
09h15	09h35	<b>John W. Ewert</b> <i>USGS Cascades Volcano Observatory</i>	More than three decades of USGS-IGEPN collaboration in volcano monitoring and hazard assessment
09h35	10h00	<i>Coffee break</i>	
10h00	10h20	<b>Graham Tobin</b> <b>Linda Whiteford</b> <i>University of South Florida</i>	Vulnerability, Resilience, and Adaptation in Response to Living with Tungurahua
10h20	10h40	<b>Jenni Barclay</b> <i>University of East Anglia</i>	Livelihoods, wellbeing and the risk to life during volcanic eruption: lessons from Tungurahua and the Caribbean
10h40	11h00	<b>Teresa Armijos</b> <i>University of East Anglia</i>	Adapting to changes in volcanic behavior: Formal and informal interactions for enhanced risk management at Tungurahua Volcano, Ecuador
11h00	11h20	Discussion	
11h20	12h00	<b>General Discussion</b>	