

**ID:** 253

**Three volcanoes: Complexities and different realities.**

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This presentation analyzes the situations experienced in areas of influence of three Colombian volcanoes that have had some type of eruption or volcanic crisis, the regulations implemented to face these situations and the results so far, of those measures. The Galeras volcano is one of the most active volcanoes in Colombia. Since the end of the 20th century, more than twenty vulcanian-type eruptions have occurred. The area evaluated as High Hazard Zone, on the volcanic Hazard Map, has been the subject of multiple regulations since 2005, when the Presidency of the Republic declared the existence of a 'disaster situation' in some of the municipalities around the volcano, defining policies to define plans, budgets and actors to adopt the resettlement of the population located in the high hazard zone of the Galeras volcano. On the Nevado del Huila volcano, three eruptions occurred in 2007 and 2008 that produced very destructive lahars in the basin that drains the volcano. In this case, the national government defined a policy document to address the reconstruction and resettlement of the population in the areas affected by the lahars. In 2008, the Machín volcano had one of the largest seismic crises, which caused the people settled in the area of the crater and around the volcano to evacuate themselves to the capital of the department. For many years, the national and regional governments have managed the purchase the farms located at the top of the volcano and the properties purchased are now environmental conservation land.

ID: 599

## **The long red zone of Montserrat (1995-present) and its challenges**

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Montserrat is a small (102 km<sup>2</sup>) volcanic island in the Eastern Caribbean which has had a unique experience with 'Red Zone' management owing to the 27-year period of restricted access to the majority of the island. The process of evacuations started following the onset of the eruption in 1995. This led to a large reduction in the island's population which fell from 10,500 to less than 3000 inhabitants in 1998. Large numbers of evacuees ultimately relocated to other countries. To mitigate against the hazard posed by the volcano a substantial unpopulated 'Red Zone' was created which covered approximately two-thirds of the island. This area included the previously most densely populated areas of the island. At the current time, approximately 61 km<sup>2</sup> of this region is a controlled access area, while another 17 km<sup>2</sup> can be subject to restrictions depending on the level of volcanic activity.

Montserrat currently faces severe economic challenges. The small population and loss of many productive industries on the island have been amplified by global economic crises. This situation creates pressures to exploit new economic opportunities within the 'Red Zone'. These pressures mount as the length of the current pause in eruptive activity increases, currently 13 years. While some activities, such as sand mining and tourism, have been permitted in the 'Red Zone' under controlled conditions there are calls for other activities.

Effective risk analysis and communication strategies to provide authorities with a robust data based foundation for improved decision-making are currently being developed.

ID: 631

## **Over the River Chronicles - Re-Imagining the Red Zone Take 2 - Action!**

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Over The River Chronicles presents a series of 3 short films directed by participants of the Explosive Transformations Film Project. The northernmost Garifuna Communities in St. Vincent have lived with La Soufriere Volcano for centuries. Using participatory methods, narratives of living with La Soufriere Volcano have been produced from the community perspective. This body of work celebrates the hidden role of indigenous and experiential knowledge from the Red Zone in shaping our understanding of the environment and living with volcanic risk.

Part I - MOVING ON - The most recent eruption of La Soufriere Volcano in April 2021, once again resulted in the evacuation of communities to the south of the island. Moving On is a film documenting some of our experiences during the evacuation, in our journey moving back home and relocation for those most affected. Through it all we are strongest when we move together.

Part II - RETURN TOGETHER - A short film sharing some of our difficult experiences due to the eruption and how we stuck together as a community. The spaces we share, our traditions and what makes us unique - it brings us hope to return to the place we call home.

Part III - A VINCENTIAN CASSAVA STORY - Although undervalued and seldom heard about, Cassava is a powerful and adaptable root crop with many benefits. Moreso, did you know that cassava has bonded families and communities together and is possibly one of the reasons our ancestors lived long lives? Come! Let's explore a bit!

## **The complex and often contradictory realities of the red zone**

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Red Zones, “exclusion zones”, or areas deemed by state authorities as being “uninhabitable” around volcanoes often remain home to many. While these demarcated spaces are no-go areas in geological or disaster risk management terms, the reality and immediate needs of those who inhabit them is more complex. We will discuss three communities in Guatemala declared exclusion zones: La Nueva Comunidad Indigena la Trinidad, Las Palmas on the flanks of Fuego volcano, and Canton Panabaj, in Santiago Atitlán. With no viable alternative living spaces provided by the government or municipalities, people continue to live in these areas. The sustainability of livelihoods is a key driver for remaining despite the threat of volcanic activity or landslides. In all three communities, people left for periods of time, returning when the immediate danger was past, and/or life elsewhere became too difficult. During the global pandemic, people mobilised between places where quotidian and pandemic risk was deemed to be higher and returned to the volcanic exclusion zones. Some live a mobile life between their old home and their new, negotiating a complex re-imagining of “home”, drawing on the resources of both spaces to piece together new lives. These communities have been condemned to an increasingly marginal existence with no provision of water, electricity, or schools by a state which does not support their existence. In turn, such conditions can increase risk further.

ID: 753

## **The Community-Based Vigía Network at Tungurahua volcano, Ecuador Provided a Safety Cushion for Those Living in the Red Zone**

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Tungurahua's eruptive activity spanned 1999 to 2016. The IGEPN established the Tungurahua Volcano Observatory (OVT) 13 km from the summit and the telemetry to incorporate signals from monitoring stations installed on the 5000m high symmetrical stratocone.

After Strombolian fountaining and Vulcanian explosions became common, it was apparent that eyes and ears were needed on the cone's blindsides. Thus, the vigía network was established in late 2000. Volunteers were selected based on their location and their communication skills. Many of the 20+ vigías lived in villages located in the Red Zone. Their frequent contact with OVT staff, participation in daily radio calls, and OVT training workshops prepared them to serve as advocates for prompt evacuations from their villages when the situation warranted. They appropriated the daily scientific information shared with them by OVT, which kept them informed of possible forthcoming eruptive activity. Additionally, citizens benefited from "benevolent volcanic activity" since pyroclastic flows didn't materialize until 2006.

The combination of OVT and vigías provided a collaborative network that communicated all aspects of eruptive activity. While OVT had no inference on residents' decisions to continue living in the Red Zone, vigías in radio contact with OVT provided a safety cushion. Guidance by their vigías incentivized citizens to evacuate when a situation was untenable, a decision they could make because they had ingested scientific information from OVT staff. The few deaths during the eruptive process is a measure of the success of this combination.

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**Living in the red zone: over estimation of hazard, weakness of the law, or both?**

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High volcano hazard zones are theoretically considered as exclusion zones in DRR strategies and land use standards. In Chile, the latter is accomplished through the so-called Plan Regulador (PR) at municipality level, although some of them lack this instrument or have one out-of-date. This guide defines uninhabitable areas and poses restrictions to the public infrastructure. However, that definition is usually surpassed because a number of reasons, from basic need of shelter, weakness of the law and pressure from the real estate business. As a consequence, nearby the most active volcanoes in Southern Andes a growing amount of permanent and summer houses is recognized inside the red zones. This situation calls for an interdisciplinary analysis of the drivers and this contribution is intended to address the problem beginning with the delineation of hazard zones. We find that some PR are older than 20 years and are based on geologically-based hazard maps that usually consider the worst-case scenario, or lack any quantification of the relative probabilities for the wide range of scenarios. The latter might be producing over estimation of the volcanic hazards, even despite the shorter expected useful life of the infrastructure. In other places, land settlements are directly built on top of laharc deltas related to historically active drainages. In our view, a more equilibrated land use strategy in Chile requires both an updated hazard assessment with objective delineation of the hazard zones and also a management tool with higher rank in the national regulatory order