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About Time: Volcanism Between Indigeneity and Risk Across the Chile – Argentina Border

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Time is a central concept within volcanic risk reduction – emergency managers refine evacuation times, while volcanologists compare past eruptive sequences with present conditions to calculate possible futures – yet time is rarely discussed explicitly. The underlying assumption is that time is a uniform metric to be managed and measured, yet the various imaginaries of time (the ways in which we make meaning from the concept) have yet to be explored in this context. This paper argues that although time can be measured with clocks and calendars, human experience of time is variable and elastic; that time is valued and weighted differently by various individuals, communities and institutions. The paper reframes some of the (mis)communication issues in the power-laden negotiations required to mitigate volcanic risk in terms of con/disjunctures between various imaginaries of time – both in scale (e.g. geological vs human vs evacuation timescales) and temporality (relationships to past, present and future). The work is empirically grounded via a case study: the data emerged through 9 months of ethnographic fieldwork with two of the transhumant Mapuche/Pewenche communities who live-with Copahue volcano, on the border between Chile and Argentina. The findings indicate that volcanologists and emergency workers are keen to collaborate with the communities considered to be ‘at risk’ in the territory, but are often at a loss to understand how or where to start – or why their current approach is not well-received. The paper highlights how the proposed (re)framing might improve future communication and collaboration efforts.

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Experiential knowledge and narratives: Eruption stories of residents around Mayon and Bulusan Volcanoes, Philippines

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We present the analysis of experiential knowledge and narratives from volcano eruption stories of residents around Mayon and Bulusan Volcanoes. To document contemporary volcano history, we collected field data through semi-structured interviews of residents. We recognize the importance of residents' perspectives of eruptions, and how meanings from these human experiences may be drawn. Having lived all their lives near the volcano, residents constructed their beliefs and views about volcanoes, eruptions, and hazards based on comparisons of their lived experiences during these eruptive events through time. These varied lived experiences are both geographically and temporally influenced. These various eruption experiences through time and their shared meanings enabled the residents to differentiate volcano behaviors which influenced their decision-making and therefore how they responded during specific events.

Our Bodies, Our Territories: Exploring the role of action research in understanding and shaping narratives of women's leadership roles during Volcanic Crisis

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Women are often labelled as 'vulnerable' in emergency response efforts and in disaster risk studies (Seager, 2014; Fatourus et al, 2021). Yet, it is also known that women engage with disaster risk activities much more than men (Brodar et al, 2020; Clissold et al, 2020). However, imaginaries around women's vulnerability persist and have an impact on their ability to respond to and recover from disasters.

In this presentation, we explore the results of an action research process with women leaders in Volcan de Fuego, Guatemala, part of the "Ixchel Project: Building understanding of the physical, cultural and socio-economic drivers of risk for strengthening resilience in the Guatemalan cordillera". First, we will show how and why women become leaders during volcanic crisis, and the imaginaries and narratives that impact these roles. Engaging with the knowledge co-produced with women leaders over the past two years, we ask, what does it mean to be a women leader before, during and after a volcanic eruption? What are the consequences of this type of 'caring' for these women and their families? In addition to that, we will also reflect and comment on the role that research can have in understanding and reshaping these same imaginaries. Specifically, we explore the use of decolonial and critical feminist theories and methodologies from Latin America to uncover women's relationship to their volcanic territories, as part of their bodies and identities. We also explore, how in this process, our own bodies and identities as researchers have also been transformed.

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Volcanic risk perception of population exposed to highly active volcanism in the Southern Andes: Villarrica volcano, Chile.

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Volcanic risk perception refers to collecting, selecting, and interpreting signals of uncertain impacts from volcanic activity and influencing people's behavior in volcanic emergencies. Specialized literature identifies factors for volcanic risk perception analysis, including knowledge, experiences, trust, sense of community (attachment to the place), demography, and proximity. This research uses as a case study the population exposed to proximal activity from Villarrica Volcano in Chile, which is one of the most active volcanoes in the Southern Andes. Villarrica has produced over seventy eruptions historically, with fatalities and damage to buildings and infrastructure mainly by lahars. Currently, proximal hazard areas from Villarrica are increasing in both permanent and seasonal populations with a growing number of summer visitors. This research presents a volcanic risk perception assessment by applying over four hundred questionnaires inside the high volcanic hazard zones surrounding Villarrica Volcano, which represents rural and urban areas. The surveys collect information about risk perception factors such as knowledge, internal trust, and attachment to the place and explore potential behaviors such as self-protection, family prevention planning, and actions to reduce risk. Those factors are clustered by a statistic analysis (k-means), which results in a five-tier scale of relative risk perception levels (i.e., very low, low, moderate, high, very high). This contribution describes resulting risk perception levels based on the statistical influence of risk perception factors. It also provides a general demographic characterization of those levels to support identifying relatively more vulnerable groups and thus would be useful to focus public policies on the matter.

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Los volcanes como testigos del territorio en Guatemala: memoria, representación e imaginario

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Esta ponencia quiere abordar los imaginarios y las representaciones que se han construido y creado alrededor de los volcanes en Guatemala. El magnetismo energético que existe hacia estas montañas fogosas es innegable, pues el paisaje influye nuestra psique, alimenta nuestras memorias y la forma de contarnos a nosotros mismos. ¿Qué tantos secretos han guardado por años los volcanes? A lo largo de los años han visto, conquistas, guerras, rebeliones, dictaduras e injusticias que se repiten una y otra vez. Los volcanes no son paisajes congelados. Su geografía cuenta una historia, pues son los testigos de ese tiempo efímero que pasa frente a ellos. El misterio hacia ellos nos sigue fascinando, los representamos, documentamos, exploramos y fotografiamos. Desde los tiempos más antiguos, los volcanes (de lo que ahora nombramos como Guatemala) fueron representados en códices e incensarios prehispánicos. Las primeras representaciones de los volcanes durante la conquista están en lienzos o frescos. Con el surgimiento de la fotografía guatemalteca han sido constantemente representados e, inclusive, en ocasiones coloreados en las fotografías impresas. Sin embargo, a su vez, son de forma “involuntaria” parte de la memoria visual cuando aparecen omnipresentes en un segundo o tercer plano. Siendo testigos de lo que está sucediendo frente a ellos: la modernización de una ciudad, una manifestación, un desfile militar, un avión, apunto de despegar, un enfrentamiento social, etc. Finalmente, los volcanes, son los testigos totales del territorio que habitamos. Siempre han estado ahí seguirán estando cuando ya no estemos.

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El Geopedregal, un modelo de educación en Ciencias de la Tierra sobre conservación del Geopatrimonio.

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El derrame del volcán monogenético Xitle, hace aprox. 1600 años, ubicado al sur de la Ciudad de México en el campo volcánico de la Sierra del Chichinautzin, ha sido urbanizado en un 70% perdiendo casi todo el geobiopatrimonio. Gran parte de esto se conserva en una reserva ecológica en el mismo campus de la Universidad Nacional Autónoma de México, una de las Universidades más grandes de Latinoamérica. La vegetación asociada es un matorral de palo loco (*Pittocaulon praecox*) con una enorme biodiversidad y endemismos debido a las adaptaciones microambientales sobre las lavas pahoehoe. Dentro del mismo campus que, es patrimonio UNESCO, a pesar de que se conservan más de 270 ha, muchos pedregales han quedado ahogados entre las construcciones y sirven de amortiguamiento a las zonas de conservación de la reserva ecológica. Uno de estos pedregales, el Geopedregal, ha sido completamente restaurado a la vegetación original con el objetivo de que siga cumpliendo los servicios ecosistémicos a la comunidad, que dignifique la identidad de los espacios donde se mueven los universitarios y que, además, permita dar a conocer a la comunidad a través de recorridos guiados, el geo-biopatrimonio que conserva.

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Using Ethnography to Describe the Cultural Importance of Volcán de Colima within the state of Colima, Mexico

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Volcán de Colima sits in the far north corner of the small state of Colima in W. Mexico, giving the volcano a geographically dominating position. This ethnographic study examined the cultural importance of Volcán de Colima within the society of Colima, through local people's perspectives, artworks, and businesses. Short interviews were conducted with random individuals from several communities at varying distances from the active, frequently erupting volcano, including La Yerbabuena, La Becerrera, Cofradía de Suchitlán, Suchitlán, Comala, and the city of Colima. Qualitative interview questions were developed to collect information and assess significant themes, such as the individuals' feelings about living near an active volcano, the individuals' perception of volcanic risk, how they and their communities behave during volcanic eruptions, the cultural role of the volcano in the community, and the beliefs, myths, and legends shared by these individuals about Volcán de Colima. A total of twenty-one interviews were transcribed and reviewed using ethnographic data analysis. Over three hundred images of media containing depictions of Volcán de Colima, including community murals, sculptures, business logos, and advertisements, were then examined using content analysis, noting the people, objects, activities, and symbols present in the media. The location of the artworks and businesses, as well as the intended audiences, were also recorded during analysis. Finally, the media was examined for reoccurring themes. Our results suggest that Volcán de Colima plays an integral role to the culture of Colima, dually existing as a geographical icon and a powerful representation of Colima's people themselves.

“El Fantasma de Armero” un reto en la gestión del riesgo volcánico del volcán Nevado del Ruiz, Colombia

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La historia de la gestión de riesgo volcánico en Colombia se remonta 38 años atrás. Esta se asocia a la reactivación del volcán Nevado del Ruiz (VNR) y al desastre generado con la erupción del 13 de noviembre de 1985. El VNR es amplia y tristemente reconocido a nivel mundial por ser el volcán que generó uno de los desastres más grandes de origen volcánico en el siglo XX, asociado a la generación de lahares que destruyeron la población de Armero en el departamento del Tolima y causaron importante afectación en el departamento de Caldas. Este desastre dejó importantes lecciones para Colombia y el mundo en la gestión del riesgo volcánico, logrando evitar con éxito desastres similares. Pero a pesar de esto, en el país, especialmente en el área de influencia del VNR, las comunidades y otros actores, ante la posibilidad de una nueva erupción del volcán, tienen la percepción de desastre inminente y repetición del escenario 1985, lo que se ha denominado como *el fantasma de Armero*. Esta percepción tiende a sobrevalorar la amenaza volcánica al asumir para las zonas de amenaza media o baja fenómenos peligrosos que caracterizan la zona de amenaza alta, evidenciando que en momentos de crisis son movidos más por el miedo generado por información sensacionalista de algunos medios de comunicación que por un conocimiento específico de su territorio. Lo anterior es un gran reto en la búsqueda de la apropiación social del conocimiento geocientífico y la gestión exitosa del riesgo volcánico.

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Vesuvius: the Model Volcano?

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In the 18th and 19th centuries, Vesuvius was the most active volcano in Europe. It was accessible to day-trippers, travellers and natural historians and being 'not so small as to be contemptible not so great as to be unapproachable', it features prominently in written and visual records of visitors from across Europe.

By the late-18th century, Vesuvius was a model for the concepts of the sublime; and so widely cited, that it was regarded by some as a 'tired metaphor'. In the early 19th century, Vesuvius became a laboratory for natural scientists; and a physical observatory. In parallel, visual representations of Vesuvius in eruption found a ready market among tourists, with grandiose gouache representations of fire and smoke by day and night; and as an agent of catastrophe in popular novels.

But to what extent did this exposure help to shape European audiences' views of volcanoes, around an imagined ideal? And to what extent are the visual and textual records of Vesuvius faithful to what was happening at the volcano, or curated for particular audiences? Using letters, diaries, paintings and sketches, we explore depictions of Vesuvius in the 18th and 19th centuries. Some common themes are influenced by the social and cultural setting: whether through deference to authoritative voices, or to meet the expectations of the recipient. In contrast, records of some phenomena that were intimately linked to Vesuvius' physical state contributed to the emerging narrative 'natural history' of the volcano, and the search to understand their causes.

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Creative Engagements with Volcanic Materials and Images from the Soufrière Hills Volcanic Crisis (Montserrat, West Indies)

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As suggested in the material and ecological turns of the past two decades, objects and environmental forces can have agency (or “actancy”) on the world around them. Understanding the networks and connections between different entities or nodes is, therefore, central to understanding their cultural and ecological importance. In volcanic landscapes, a distinctly volcanic materiality develops through the interaction between volcanic materials and human actions. How does this volcanic material culture act on individuals and communities and what can it reveal about the cultural effects of active volcanism?

Located on the Caribbean island of Montserrat, the Soufrière Hills volcano began erupting in 1995 and has remained in a state of heightened activity ever since, effecting the evacuation and destruction of large portions of the island. The protracted volcanic crisis has offered many opportunities for cultural engagements with eruptive products, objects that display physical changes due to their exposure to volcanic forces, and images of the eruptions. Three aspects of art-based engagements with the materials and images of the Soufrière Hills eruptions are the salvaging and display of volcanically-altered objects, the graffiti that have been wiped into ash-covered surfaces in the evacuated settlements, and the dissemination of images of the eruptions. These creative engagements with the volcanic crisis have a myriad of aims, from memorializing past places and practices in the present, to reinscribing humanity on a landscape wrested away by the volcano, to transforming negative experiences of the eruptions into marketing materials for invigorating the local economy.