

Sensors as a tool to understanding hazards and connecting people in hazard-prone zones.

Marjorie Encalada Simbaña¹, Jenni Barclay^{1,2}, Teresa Armijos³

¹ *University of East Anglia, Norwich Research Park, Norwich, Norfolk, NR4 7TJ, UK*

² *University of Bristol, Beacon House, Queens Road, Bristol, BS8 1QU, UK*

³ *The University of Edinburgh, Old College, South Bridge, Edinburgh EH8 9YL, UK*

Citizen Science projects have been developed and applied to create collaborations with people without formalised science training in risk zones and thus contribute to Disaster Risk Reduction (DRR). However, a focus on the collection of data to define hazard behaviour is important but not all that is needed for DRR.

In this presentation, we explore a research project that involves a different kind of citizen science, that is 'people-centred', focused on the knowledge, interests, and needs of communities at risk. The methodology begins with meetings and different participatory workshops. These are designed to foster relationships between the participants creating a shared understanding of hazards, their monitoring, and their impacts. At this point sensors (Seismometers, weather stations) were installed by the communities in collaboration with scientists, implementing their new knowledge. This acted to not only enrich and deepen the conversation about the hazards they are exposed to but integrate the experiences, and perspectives of community members. Then everyone had a wider understanding of the expectations that each of the actors in risk areas have about the sensors, but also about the data, its history, its use, its application, and its importance for both scientists and non-scientists. It is our aim that all participants have more tools for decision making before, during and after the occurrence of an adverse event related to geological hazards, and there are open channels of communication between the different actors as a consequence of this approach.

ID: 463

Collaborative modular scenario development for caldera volcanic risk management: Caldera volcanoes in Taupō Volcanic Zone, Aotearoa – New Zealand.

Rodrigo Calderon ¹, Thomas Wilson ¹, Graham Leonard ², Sarah Beaven ¹, Thomas Robinson ¹, Josh Hayes ², Colin Wilson ³, Simon Barker ³, Finnigan Illsley-Kemp ³, Calder Advisory Group (NZ)

¹*School of Earth and Environment, University of Canterbury, New Zealand*

²*GNS Science, New Zealand*

³*Victoria University of Wellington*

Caldera volcanoes provide highly challenging conditions for risk management. While they can produce rare but very large and explosive eruptions (VEI 6 or above) with catastrophic potential, they more frequently undergo periods of caldera unrest, possibly leading to smaller eruptions, with potential impacts to society from ground shaking and deformation. This contributes significant uncertainties to volcanic hazards, risk assessment, risk management, and communication planning. This research presents a co-produced modular scenario framework using the Taupō Volcanic Zone in Aotearoa - New Zealand, as a case study, in which the Caldera Advisory Group (CAG) forms a collaboration platform for emergency managers, volcano scientists, and iwi/Māori representatives dedicated to designing caldera risk management strategies. The CAG closely collaborates with the ECLIPSE programme focused on caldera research. The collaboration identified that a suite of scenarios would be useful in representing the complexities in caldera volcanic activity and their associated potential impacts. The modular scenario development addresses future uncertainties in caldera volcanic activity, such as caldera unrest and eruptions, through a conceptual model of caldera volcanism, defining stages that represent risk management complexities. The scenario framework consists of three modules: caldera unrest (module 1), transition unrest (module 2), and eruption (module 3). The modules encapsulate a suite of sixteen scenario sequences as examples representing various facets of caldera volcanic activity, providing credible event progressions based on historical and geological data and using storylines, narratives, and scenario formats. The sequences might be combined into longer, more complex sequences, adapting to different end-users' purposes and goals.

Community Resignification of a Red Zone: Decolonial-Participatory Research Process in Panabaj Territory (Guatemala)

Cristina Sala-Valdes¹, Teresa Armijos Burneo², Diego Antonio Ruanda Sapalú³, Alex Bartolomé Petzey Quiejú³, Eliza Calder², Jeremy Phillips⁴

¹*University of East Anglia, Norwich, UK;* ²*University of Edinburg, Edinburg, UK;* ³*Community researcher, Santiago Atitlan, Guatemala,* ⁴*University of Bristol, Bristol, UK*

Territory can be defined not only as a geographic space, but also, from an ontological perspective, as a community space that enables relationships among its inhabitants; from the links between the community, its past, and its future. It is recognized that in post-conflict peacebuilding processes, actors seek to re-signify different spaces that have been linked to war (Björkdahl and Kappler, 2017:6, 10 in Armiño, 2020:157) as a way to re-build their life projects. We will argue that in the aftermath of a disaster event in the so-called red zones (an exogenous label made by institutional actors), this process of resignification is also present. This presentation will focus on the collaborative and interdisciplinary project “Ixchel: Building understanding of the physical, cultural and socio-economic drivers of risk for strengthening resilience in the Guatemalan cordillera”. Specifically, it will explore a decolonial and participatory research process led by community leaders from formal and informal associations aimed at understanding community experiences of risk. This process took place in Panabaj Canton (Guatemala), a community that has experienced both war and disaster events, making their relationship with the territory a very tensioned one but, at the same time, deeply rooted into it. We will also explore how an active dialogue of knowledges facilitated as a core aspect of the research activities, is creating the space, from bottom up, to gather different types of community knowledges and experiences. This, in turn, is unearthing a profound sense of belonging and a process of re-signification and re-dignification of their k’aslemaal.

Unleashing the power of community engagement for volcanic disaster risk reduction

Jenni Barclay^{1,2}, Teresa Armijos³, Richie Robertson⁴, Jerry Phillips², Anna Hicks⁵, Roger Few⁶, Karen Pascal⁷, Monique Johnson⁴, David Pyle⁸, Marjorie Encalada¹, Paul Cole⁹, Elisa Sevilla¹⁰ and STREVA Team¹¹

¹*School of Environmental Sciences, University of East Anglia, England, UK;* ²*Department of Earth Sciences, University of Bristol, England, UK;* ³*School of Geosciences, University of Edinburgh, Scotland, UK;* ⁴*Richie Robertson, Seismic Research Centre,* ⁵*British Geological Survey, Edinburgh, Scotland, UK;* ⁶*School of Global Development, University of East Anglia, UK;* ⁷*Montserrat Volcano Observatory, Montserrat;* ⁸*Department of Earth Sciences, University of Oxford, Oxford, UK;* ⁹*School of Geography Earth and the Environment, Plymouth University, Plymouth, UK;* ¹⁰*Elisa Sevilla, Universidad de San Francisco de Quito, Ecuador.* ¹¹www.streva.ac.uk

The aim of Disaster risk reduction (DRR) is to anticipate and reduce damage caused by natural hazards. In volcanic contexts the risk is complex and dynamic: varying both temporally and spatially. Here DRR needs to encompass response in an acute phase, target long term prevention and preparedness and incorporate uncertainties that result from the various possible interactions and outcomes arising from volcanic activity.

Based on insights garnered from ten years of evolving interactions with communities at risk in four regions of Latin America and the Caribbean, we argue that engaging with communities at risk not only embeds good practice in risk preparedness and prevention but challenges researchers to think differently about how volcanic risk itself is conceived. The experiences of communities at risk are central to this, engagement is not only about gathering risk perspectives, but about understanding how risk is constructed over widely-varying time domains from the geological, through the historical, to the human lifetime. Arts-driven and participatory approaches not only provide a platform upon which different forms of knowledge are given similar weight but contain vital insights into the combined impacts of eruptions, the consequences of scientific uncertainty, and lessons in coping with both. We now have emerging evidence that working collaboratively can unlock the vital step between understanding volcanic risk, and practically using that knowledge to minimise impact To achieve this legacy, projects need to have a clear purpose, mutual benefits, mutual interests (exciting curiosity), and be flexible enough to utilise opportunities as they arise.

Co-development of Hazard Models with Communities as a Restorative Practice: The 2005 Debris Flow at Panabaj, Guatemala

Jeremy Phillips¹, Teresa Armijos², Diego Ruanda Sapalú³, Alex Petzey Quiejú³, Mayra Reanda⁴, Maria Chojpen Reanda⁴, Ángel Xicay⁴, Domingo Alvarado⁴, Mark Woodhouse¹, Rudiger Escobar Wolf⁵

¹School of Earth Sciences, University of Bristol, U.K.; ²School of Geosciences, University of Edinburgh;

³Community researcher of Santiago Atitlán, Guatemala; ⁴Community member, Panabaj,

Guatemala; ⁵Department of Geological Engineering and Sciences, Michigan Technological University, U.S.A

In October 2005, extreme rainfall from Hurricane Stan caused a catastrophic debris flow that inundated the town of Panabaj, resulting in more than 800 fatalities. To this day, Panabaj remains a declared 'High Risk Zone', denying residents access to mains water and electricity, and banning public and private development. In this presentation, we show how co-development of a predictive model for future debris flows can create co-benefits for communities and scientists, and serve as a restorative process for community identity and agency with authorities.

Our scientific aim was to calibrate a physics-based model for debris flows (LaharFlow; www.laharflow.bristol.ac.uk) for future use in hazard assessment in the Panabaj region and across Guatemala. Apart from the source location, the initial conditions for the debris flow were unknown, so we set up a participatory process where community (and field geological) observations were used to constrain model outputs from a large ensemble of exploratory simulations. This process was conducted with representatives of diverse community groups, whose observations provided a set of critical constraints on flow pulse timings and routing. In a context where indigenous and local knowledge is not recognised, or is seen as having less value than scientific knowledge, we show that co-developed modelling can be a rebalancing process in which communities are seen to be key knowledge holders, and co-creators of tools for societal benefit. Specifically, model calibration can preserve the identity of affected locations, and form part of a process where dignity and agency with authorities is restored.

ID: 764

Recognising, honouring, cultivating community agency: the co-production of collective knowledge for disaster risk reduction

Monique Johnson¹, Shemron Yorke¹, Clyornique Durrant¹ Richard Robertson², Jenni Barclay³, Jeremy Phillips³, Teresa Armijos Burneo⁴, Bridie Davies⁵, James Christie⁵

¹*Wubu RuGu Communities Inc. St. Vincent and the Grenadines*

²*University of the West Indies*

³*Bristol University*

⁴*University of Edinburgh*

⁵*University of East Anglia*

More than a year after the 2021 La Soufriere eruption, heavy rain continues to generate lahars that cause significant impacts to people's lives and livelihoods, including the destruction of homes and damage to main roads. With its participatory arts and science methodology, the Changing Landscapes Project was developed bringing together local residents with scientists and artists to co-produce knowledge to reduce risk in this rapidly changing landscape. Led by a group of interdisciplinary researchers from the UK and the Caribbean, participants were invited to observe and document changes in their landscapes using a combination of photography and more recently film coupled with rain gauges. Through a series of engagements, narratives have been developed, and rainfall data from installed gauges in the upper valleys of each community are being collected, monitored and maintained by the project participants. A co-produced exhibit showcasing these experiences, launched in April 2022 and in April 2023 films produced and directed by the group were premiered at the local Hairouna Film Festival. In this presentation we explore the challenges and opportunities of interdisciplinary participatory arts and science projects that aim to integrate community knowledge. We argue that this methodology can be (1) a vehicle to involve otherwise excluded communities in data collection and knowledge generation for disaster risk reduction, (2) a space to equalise different forms of knowledge and, (3) ultimately, a means to build and honour alternative forms of representation, response and recovery from disaster.

ID: 766

The Montserrat Volcano Babies project: a local take on international research impacts

Karen Pascal^{1,2}, Thiffanie Williams¹, Jenni Barclay³, David Pyle⁴, Bridie Davis⁴, Graham E. Ryan^{1,2}, Erouscilla P. Joseph²

¹Montserrat Volcano Observatory, Montserrat; ²Seismic Research Center, University of the West Indies, Trinidad & Tobago; ³School of Environmental Sciences, University of East Anglia, Norwich, UK; ⁴Department of Earth Sciences, University of Oxford, Oxford, UK;

The “Curating Crises” project explores the influence of colonization on volcanic crises management in the English Caribbean, including three unrests periods and the 1995-pst devastating eruption of Soufriere Hills volcano on Montserrat, causing its ongoing struggle towards recovery.

To share the research data and findings with the local population and decision-makers, the Montserrat Volcano observatory (MVO) designed the multi-dimensional “Montserrat Volcano Babies” (MVB) community project to increase volcanic risk awareness. Additionally, MVB also addressed wider societal and economic issues, through re-growing roots into the pre-1995 history, and building local capacity.

At the core of MVB is the creation of the first four community murals on the island, which capsule Montserrat’s history in general and in relation to volcanoes. The murals have been largely designed by students of the MVO-Montserrat Secondary School after school club, and by other interested artists and/or members of the community. They were guided by the MVO, its local and international partners, and international professional community artists. This artistic journey that requested the (re-)discovery of Montserrat history has also been documented in a short-documentary directed by a local film-maker, submitted to international festivals.

A wide section of Government organizations, private businesses and individuals, shared their vision for the island and enabled the Montserrat Volcano Babies project by bringing needed additional in-kind and/or financial support. By gaining an ownership of their history and sharing local and scientific knowledge through the Arts, the Montserrat Volcano Babies participants have been empowered and gave their community hopes for a brighter future.

Bridging the Volcanic Divide: Fostering Connection and Preparedness through Art in Montserrat's Youth

Thiffanie Williams¹, Karen Pascal^{1,2}, Shealsha Payne³, Daerentha Sweeney⁴, Jenni Barclay⁵, David Pyle⁶

¹*Montserrat Volcano Observatory, Montserrat;*

²*Seismic Research Center, University of the West Indies, Trinidad & Tobago;*

³*Information and Communication Technologies Unit, Government of Montserrat Ministry of Communication, Works, Labour and Energy, Montserrat;*

⁴*Montserrat Secondary School, Government of Montserrat, Montserrat;*

⁵*School of Environmental Sciences, University of East Anglia, Norwich, UK;*

⁶*Department of Earth Sciences, University of Oxford, Oxford, UK;*

On the volcanic island of Montserrat, where an active volcano looms but eruptions have eluded a generation of students, the Montserrat Volcano Observatory–Montserrat Secondary School (MVO-MSS) after-school club emerges as a beacon of connection, creativity, and volcanic risk awareness.

Initially organized to share knowledge gained through the “Curating Crises” international research project (described further in other conference contributions), the MVO-MSS after-school club became, through the adopted holistic approach to education, a transformative space for Montserrat's youth, immersed and engaged in the realm of volcanoes. During indoors and outdoors interactive activities, the students delved into volcanic history, learned about environmental dynamics, and explored cultural elements that define Montserrat. The apex of our journey was the collaborative creation of the MSS mural, encapsulating the shared vision of our students, weaving together volcanic history, the island's natural beauty, cultural symbols, and their own dreams and ambitions. The mural is not merely art; it is a vivid, cohesive representation of Montserrat's story.

Here we describe the MVO-MSS after-school initiative and how it sowed the seeds of preparedness in a generation that has not experienced threatening volcanic eruptions. Through this blend of humanities and creative arts, students not only connected with their volcanic heritage but also grasped the importance of preparedness in the face of unpredictable volcanic activity. Montserrat's youth are not only more connected to their volcanic history but also better equipped to face its unpredictable future.

ID: 285

Training programs to Improve Volcanic Disaster Preparedness Capacity Across Countries and Professions

Hikaru Yokoyama¹, Mitsuhiro Yoshimoto²

¹Department of Education. Hokusho University. Hokkaido. Japan; ²Mount Fuji Research Institute Yamanashi Prefectural Government. Japan

JICA Hokkaido is conducting a training course on "Volcanic Disaster Risk Reduction and Management for Central and South American Countries". The course was started in 2009 with geophysicist Hiromu Okada and volcanic geologist Tadahide Ui as course leaders. The presenter, science educator Yokoyama, joined the faculty in 2015, and Yokoyama has been conducting this training as course leader since 2018. The program was suspended in 2020 due to COVID19, but in 2021, Yokoyama and volcanic geologist Yoshimoto have started a new training style as course leaders.

So far, a total of 125 trainees from 9 countries have visited Japan. The trainees come from a variety of backgrounds, including researchers from national and private research institutes, national and local disaster management staff, officials such as CONRED and Civil Defense, and university faculty.

The initial training program consisted of half classroom and half fieldwork. The fieldwork consisted of visits to several active volcano areas in Hokkaido, Japan, to learn about the traces of eruptions and past eruption responses, and to observe disaster mitigation infrastructure facilities.

In the current training program, the classroom lectures are completed online, while in the field in Japan, participants learn about volcanic disaster prevention policies and how to educate and disseminate information about volcanoes to the public. By exchanging views beyond their respective professions, participants can deepen their learning on how to reduce volcanic disasters from multiple perspectives.

In this poster, we will present the results of this program over the past 15 years and its prospects.

ID: 605

Creative approaches in liminal spaces: learning from recent interdisciplinary ventures

Anna Hicks¹

Cecilia Reed²

Landscapes of the Mind Team

STREVA Team

¹*British Geological Survey, Edinburgh, UK*

²*Department of Geography, University of Cambridge, Cambridge, UK*

Truly interdisciplinary research that considers the entangled and complex relationships between the three landscape characteristics (1 – natural; 2 - cultural/social; 3 - perceptual/aesthetic) can drive forward knowledge development and exchange for volcanic risk reduction. Exploring these complexities can be time and resource-heavy, therefore sharing lessons that may provide methodological ‘springboards’ can be extremely beneficial.

In this presentation, we share empirical evidence from recent interdisciplinary research demonstrating the gains that come from shared creative experiences in liminal spaces. Here we refer to liminality as others allude to boundary spaces (e.g. disciplinary, physical, metaphorical); often one and the same as interdisciplinary spaces - where ‘magic’ may happen. We argue that this is one of the many extraordinary aspects of volcanoes (a boundary object), and volcanic environments (a boundary/liminal space), where we can challenge Western ontologies and explore relationships between our sensory reaction to, and relationship with, the sublime. Seeing these spaces as creative reservoirs to share experiences, different perspectives, tell stories and feel emotion, can generate transformational moments in knowledge production about volcanoes.

We present the approaches and findings from four participatory creative-based activities, relevant to studies on hazard and risk in volcanic environments. These comprise a visual matrix, a storytelling workshop and a creative retreat. The fourth, and most recent activity, reflects on learning from an exploratory movement-based activity conducted at Cities on Volcanoes 12.

ID: 606

Cordillera de Fuego film: a collective effort centering Guatemalan Maya Tz'utujil and Kaqchikel communities in an active volcanic landscape

E. Calder¹, A. Petzey², J. Cupples¹, J. Bustamante³, M. Kenefic³, L. Pineda³, M. M. Coroy³, A. Colom⁴, C. Chun⁵, D. Sapulu², C. Gleghorn¹, A. Roca⁵, R. Rebeiro¹, A. Cabrera Pacheco¹, R. Escobar Wolf⁶ and T. Armijos¹.

1. *University of Edinburgh, UK.*

2. *Santiago Atitlan*

3. *La Casa de Producción.*

4. *Lab Etnografico*

5. *INSIVUMEH*

6. *Michigan Tech University*

We are co-producing a feature film and TV series that centres Indigenous Maya Tz'utujil and Kaqchikel communities in Guatemala, whose lives are changed by a volcanic eruption. We aim to produce media that deals in a politically and culturally contextualised manner with the question of disasters in Guatemala, that brings together different knowledges, that represents key themes ethically, and that is both challenging and entertaining to watch. We hope to produce high levels of civic engagement and debate within affected communities and beyond.

Our team includes Ixchel project leaders who had the original vision for the project, along with a leading Guatemalan film director, his production company and a nonprofit organisation who are producing the film. Investigators include community-based Tz'utujil researchers, academics in Guatemala, the UK and the US, and researchers from INSIVUMEH, who all fed into the script development and were consulted on various aspects. Experiences and learnings from numerous communities have been woven together to produce a narrative with which many communities affected by civil war and disasters across rural Guatemala and beyond will identify.

Filming was undertaken in the volcanic landscape of Atitlán caldera and lake. The production includes professional Indigenous actors, as well as over 140 support actors from five local communities – the Kaqchikel communities of San Andrés, and San Lucas Tolimán, and the Tz'utijil communities of Chuk Muk, Cerro de Oro and Santiago Atitlán. This presentation introduces the film project and the processes employed to maximise broad transdisciplinary involvement, knowledge exchange and impact.

Las Voces del Agua: caracterización transdisciplinar del agua en un geo-ecosistema volcánico del suroccidente de Colombia

¹Samuel Cañas, ²Natalia Pardo, ³Catalina González-Arango, ⁴Nancy Palacios

¹*Departamento de Geociencias. Facultad de Ciencias. Bogotá, Colombia*

²*Departamento de Geociencias. Facultad de Ciencias. Bogotá, Colombia*

³*Departamento de Ciencias Biológicas. Facultad de Ciencias. Bogotá, Colombia*

⁴*Facultad de Educación. Universidad de los Andes. Bogotá, Colombia*

El propósito de este trabajo es integrar los conocimientos de la comunidad y la academia para caracterizar los principales nacimientos de agua en el flanco occidental del Complejo Volcánico Doña Juana en el suroccidente de Colombia. El estudio integra el conocimiento científico sobre las propiedades físico-químicas y geoquímicas de los diferentes cuerpos de agua analizados con el conocimiento local generado por los habitantes de la región, incluyendo su ubicación, características organolépticas, denominación y usos.

La metodología incluyó, por un lado, la realización de correlaciones entre las propiedades organolépticas y los parámetros geoquímicos medibles en muestras de agua, suelos/sustratos y rocas, utilizando técnicas como la fluorescencia de rayos X portátil (XRF) y espectrometría de masas con plasma acoplado inductivamente (ICP-MS). Por otro lado, se llevaron a cabo cartografías sociales y se analizaron para establecer los significados, representaciones y la importancia que el agua tiene para las comunidades.

Este proyecto contribuye a comprender la relación entre la perspectiva social y la geoquímica del agua, siendo relevante para establecer un lenguaje común entre la ciencia y las comunidades locales, orientando tanto las acciones de estas últimas como las políticas públicas relacionadas con la conservación y el monitoreo de las fuentes hídricas, esenciales para garantizar la supervivencia y el bienestar de la población. Además, los hallazgos del estudio pueden informar el diseño y la planificación de iniciativas centradas en la vigilancia volcánica y su impacto en las comunidades.

Palabras clave: geoquímica ambiental, sistema hidrotermal, suelos volcánicos, geoquímica del agua, XRF portátil, espectrometría de masas, cartografía social, saberes comunitarios."

Insights into interdisciplinary volcanology from the PREVIA project study of Apoyeque, Nicaragua: Preparation and Resistance to Eruption of IberoAmerican Volcanes

Jane H. Scarrow¹, Catalina Argüello-Gutiérrez², Martin Danišák³, Axel K. Schmitt³, Araceli García-Yeguas⁴, Jesús Garrido Manrique⁵, María del Pilar Ibarondo-Dávila⁶, Soraya E Layton Jaramillo⁴, Eveling Espinoza Jaime⁷, José Armando Saballos Pérez⁷, Carmen Gutiérrez Gutiérrez⁷, Wilfried Strauch⁷, Sagrario Balladares-Navarro⁸, Leonardo Lechado-Ríos⁸, Marjorie Isabel Toruño Alvarez⁹

¹*Department of Mineralogy and Petrology, University of Granada, Granada, Spain*

²*Department of Education, International University of La Rioja, Logroño, Spain*

³*John de Laeter Centre, Curtin University, Perth, Australia*

⁴*Department of Didactics of Experimental Sciences, University of Granada, Granada, Spain*

⁵*Department of Civil Engineering, University of Granada, Granada, Spain*

⁶*Department of Financial Economics and Accounting, University of Granada, Granada, Spain*

⁷*Nicaraguan Territorial Studies Institute, Managua, Nicaragua*

⁸*Archeological Centre for Documentation and Research, National Autonomous University of Nicaragua, Managua, Nicaragua*

⁹*Geophysics Research Center, National Autonomous University of Nicaragua, Managua, Nicaragua*

Long-dormant volcanoes with highly explosive past eruptions are particularly dangerous and often disproportionately impact vulnerable and marginalised societal groups. Thus, the necessity for a paradigm shift from response to anticipation in volcanic studies.

The PREVIA project is investigating Apoyeque volcano, Nicaragua: last known eruption 50 BCE (1), VEI 6, ~30 km from Managua (population ~1 million). Work is being undertaken in collaboration with colleagues from the Nicaraguan Institute for Territorial Studies (INETER) and the National Autonomous University of Nicaragua (UNAN-Managua).

Focuses include: geochronological dating of volcanic deposits; geophysical early warning systems; archaeological records of past eruption impacts; psychological assessment of communities' risk perception and needs; evaluation of children's mental models of volcanoes; as well as economics, law and urban planning.

Different disciplines have had variable success in obtaining useful data and, therefore, interpretations that may be applied for societal benefit. Reasons behind this will be discussed.

A key question is how can a 'symbiotic feedback loop' be generated between natural and social sciences research? Achieving this would permit a holistic approach and real-world application of results to a societal problem: strengthening resilience and well-being of communities living with volcanoes.

A protocol we are investigating is using psychological assessments to guide design, content and style of geological outreach. Effects of the science communication interventions could then be assessed with semi-structured interviews to inform future initiatives and research. In this way, capacity building, reduction of inequalities and sustainable development could be maximised.

1. Freundt and Kutterol, 2019, Bull. Volc., doi:10.1007/s00445-019-1321-x

ID: 55

Applying external experience to observatory best practices: Prioritizing interpersonal skill development for successful collaboration on interdisciplinary teams

Holly Weiss-Racine

Cascades Volcano Observatory, U.S. Geological Survey, Vancouver, Washington, USA.

Successful interdisciplinary teams require a diverse range of interpersonal skills. In highly specialized career fields, opportunities to develop critical interpersonal skills can be a low priority in pursuit of advanced degrees, professional licenses, and technical capabilities. Although interpersonal skill development is well recognized as a key factor for success, investment in developing these skills still lags far behind investment in technical skills.

At the U.S. Federal Highway Administration (FHWA), Western Federal Lands Office, an officewide polling of ~200 staff indicated that poor interpersonal skills were the root cause of numerous issues for the interdisciplinary project teams (consisting of civil engineers, geologists, biologists, planners, surveyors, materials engineers, hydrologists, bridge engineers and others). Office leadership recognized the need to prioritize the development of these skills. Our team created an interpersonal skills training program and after two years of training, polling results indicated that issues regarding conflict resolution, understanding different personalities and perspectives, sharing accountability, self-reflection, and effectively maintaining communications were significantly improved. Staff also reported that the culture of the office had improved.

It remains clear that developing interpersonal skills is a critical component to successful team collaboration. The lessons learned from the successful FHWA implementation of an interpersonal skills training program across numerous technical disciplines could be applied at observatories to address or avoid similar challenges within interdisciplinary teams.