



From VOG to VUMO: Science communication and the role of socio-technical interrelations in the stabilisation of new volcanic realities

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This paper traces the association between human and non-human actants that stabilised the use of “vog” as a descriptor of air pollution caused by Kilauea, an active Hawaiian Volcano. It then compares and contrasts this with the nascent stabilisation of “vumo” as a term to describe similar and yet materially different pollution, caused by Nicaraguan volcanoes, in particular Masaya.

We then propose methods of novel science communication via extended reality applications (virtual/augmented/mixed) and media dissemination. The aim is to establish vumo as a meaningful term in engaging affected populations in the potential mitigation and warning systems that are being explored by the UNRESP project team (<https://unresp.wordpress.com/>) studying the volcanic gaseous emissions on primary experiences of local populations.

By exploring how these terms become descriptors and ultimately arbiters of reality through a combination of natural science, engineering, science communications, creative engagement and community outreach, the paper explores how new realities arise from the interaction of multiple and heterogeneous human and non human actors.

Vog is a form of air pollution that results when volcanic emissions (a mixture of sulphur dioxide, other gases and particles) mix and react with the ambient atmosphere. The word is a portmanteau of the words “volcano” and “fog”. It became popularised in the 1980’s when the ongoing eruption of Kilauea started to significantly impact the residents of Hawaii.

Since then, the term routinely describes the material impact of volcanic activity on the lived experience of Hawaii residents, with its inclusion in real-time forecasts and conversation. The combination of the natural phenomenon, instrumental measurements and forecasting to residents stabilised vog as a representation of the volcanic plume.

Real-time vog forecasts and air quality observations are publically available (<http://ivhhn.org/vog/content/vog-information-portal>). Work is ongoing in the USA to include vog in the National Weather Service official forecasts (Hawaii Volcano Observatory, personal communication).

This paper uses the establishment of vog in Hawaii as a comparative departure point for a new term being used to describe the impact of a different volcanic activity - vumo - a combination of the Spanish word for smoke “humo” and volcano “volcán”. Inspired by the forecast potential of vog, its primary objective is to differentiate between the gaseous emissions from the Masaya volcano and smoke hazards such as emissions from solid fuel fires.

In December 2017, the new term vumo and a numerical forecasting model was presented to the local community of El Panama, situated 2 km from the Masaya volcano using posters, videos, oral presentations and the novel use of video mapping onto a 3D model of Masaya volcano.

The outreach materials were designed using methodologies derived from the community’s primary experiences - such as “The breeze burns my eyes and throat”. Through communicating the science through a shared causality, the team were able to effectively communicate the complexities of the plume forecasting model to a community with relatively poor literacy and little experience of printed maps and Google Earth.