



## **UNRESP project, Masaya volcano, Nicaragua: developing human exposure guidelines to sulphur dioxide in the monitoring and modelling of continuous gas emissions for the management of the safety of residents and visitors.**

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Tourists can be killed or injured in the crater areas at volcanoes in the event of unexpected explosive activity or the accidental inhalation of toxic gases, the occasional incident being followed by authorities limiting access to hazardous locations. With the recent huge increase in the numbers of tourists in countries with active volcanism, emergency officials are having to contemplate the measures that would be needed to limit large tourist movements in the event of a major volcano suddenly manifesting signs of eruptive activity, e.g., in the densely populated Bay of Naples area. Unrest at Nea Kameni at Santorini in 2011 – 2012 led to gas plume modelling to investigate the potential impact of a continuous eruption of volcanic gases polluting the air over the island for many months which would have had major implications for tourism (Jenkins et al., 2015). In Iceland the gas plume from the Holuhraun fissure eruption, 2014 – 15, impacted on all parts of the country depending on the prevailing wind, raising concerns on how to limit tourist movements for their own safety, particularly in larger gas eruptions in the future. In the UNRESP project (<https://unresp.wordpress.com/>), which is advancing the monitoring and modelling of the gas plume at Masaya volcano, Nicaragua, we reviewed these challenges and suggest a rationale for setting ambient air quality guidelines specifically in volcanic areas for acute exposure to sulphur dioxide (the principal toxic gas that can be readily monitored in real time), to protect local residents and visitors, and which would also have wider application in managing safety at degassing volcanoes elsewhere.